THE

QUARTERLY JOURNAL

OF

ECONOMICS

MAY, 1909

THE PROPOSAL FOR A CENTRAL BANK IN THE UNITED STATES: A CRITICAL VIEW.

SUMMARY.

Introduction: the success of existing central banks, 363.—Minor obstacles in the United States, 365.—The functions of central banks, 369.—I. The activities of central banks in normal times, 373.—The absence of branch banking an insuperable obstacle in the case of government deposits and the issue of notes, 380.—Credit notes a dangerous instrument, when the use of deposit credit is general, 386.—II. The precautionary stage in the policy of central banks, 388.—The sliding scale of discount would be ineffective in the United States, 393.—The kind of central bank which has been proposed for the United States is unlike those in Europe, because it would not be able to restrain credit expansion, 396.—III. Activities of central banks during crises: a central bank not needed to handle the foreign exchange situation, 400; or to insure the continuance of loans, 403.—The suspension of payments can be remedied without revolutionary changes in our present system, 407.—Conclusion, 413.

During recent years, and especially since the crisis of 1907, the proposal to establish a central bank in the United States has received an increasing measure of favorable consideration, and is now being urged by an influential, if not numerous body of bankers and others interested in the improvement of our present system. Dissatisfaction

with the working of our credit machinery has become general, and is certainly not without foundation. It is an exceptional year that does not witness troublesome friction in its operation, while on occasion of severe financial strain it has almost invariably broken down, with disastrous consequences to the entire business community. To establish a central bank as a remedy for these ills would indeed involve a radical and even revolutionary departure from our banking traditions and practise. But therein may perhaps be found no small part of the attractiveness and promise of the proposal. Legislative safeguards are already far more numerous and detailed than in any other country, and our banks hold more money in proportion to credit liabilities than is customary elsewhere, with the possible exception of France. In spite of these apparent sources of strength, fluctuations in the rates for loans in our financial centers are far more violent than in London and other European capitals. This, however, is a small matter compared with the successive suspensions of cash payments to which our banks have resorted during the three great crises which have taken place since the organization of the national banking system.

Observation of the superior results achieved elsewhere certainly affords a most humiliating contrast, an apparent explanation of which is the presence of a central bank in all the principal commercial countries, with the exception of the United States. In this connection it is noteworthy that the main causes to which our troubles are commonly attributed are found in our peculiar methods of dealing with matters which are elsewhere made the concern of central banks. The withdrawal of money from general use under the operation of the independent Treasury system is unknown where central banks are employed as government fiscal agents. A more or less elastic note

issue is secured in all countries having central banks, with the exception of England. Finally, these banks are the main-stay of credit in times of acute financial strain. Conservatively managed, as they commonly have been, they have been able to lend freely in emergencies, and have also taken the lead in securing united action among the other banks. Certainly, foreign experience seems to warrant the belief that a central bank might prove an adequate remedy for our financial ills.

To these considerations in favor of a central bank, additional force is given when recent foreign literature and legislation on banking are considered. In his classical work upon the proper policy for a central bank, Bagehot, writing nearly forty years ago, was not convinced that the monarchical principle in banking was by any means the best. He accepted it for England as a product of long historical growth familiar to every one, and therefore better than a more perfect system, which would require revolutionary changes. But since his day the central banks have become stronger and more conspicuous; new ones have been established, notably in Japan and Switzerland; and without exception they have grown in power and prestige. This development, it is true, has not been due to banking causes alone. Political and also military considerations have been potent influences. But there can be no question that in European business circles, as well as among economists, the central bank has been generally accepted as a valuable, if not indispensable, feature in a highly developed and satisfactory banking system.

With so strong a presumption in its favor the proposal to establish a central bank in the United States deserves thoughtful attention and careful analysis. Weighty objections to the plan must be based upon grounds which make it reasonably certain that the central bank could not

achieve those results which have been secured in other countries. Certain difficulties, however, which are not fundamental may properly be given at least passing attention. They are of a nature of which account must be taken if general public approval is to be secured for the measure, and which would render the task of a central bank exceptionally burdensome.

With the exception of Russia, there is no country of anything like the area of the United States in which we may study the operations of a central bank, and comparisons drawn from that country would be valueless, and even misleading, because of the relatively slight development of its credit machinery and on account of the autocratic power of the Russian government. Whether difficulties of a serious nature would manifest themselves on account of the size of the country must therefore be largely a matter of personal opinion, as to which wide differences may be expected. It may, however, be stated with some confidence that it would not be possible for a central bank to place a branch in every locality, taking, for example, the county as a unit. Thousands of branches would be required to provide facilities as generally accessible as those afforded through the five hundred branches of the Bank of France or of the Bank of Germany. Administrative difficulties would be insurmountable, to say nothing of the almost equally serious obstacle of a political nature arising from the bitter opposition of local bankers.

But numerous branches are not essential for the successful operation of a central bank. The Bank of England, which has but eleven branches, is in this matter a more suitable example. Branches in fifty or perhaps one hundred cities might be expected to afford the means of extending the operations of the central bank to all parts of the country. The control of these branches would, in-

deed, be peculiarly difficult on account of the distances which would separate many of them from the head office. Here the example of Canada might be thought to supply a precedent. But the situation is not parallel, because of the vastly greater responsibilities which would rest upon the managers of the branches of a central bank on account of the peculiar nature of its business. Finally, an interesting minor consequence of the size of the country may be noted. It would not be possible to despatch money or notes from the head office to the branches, or to other banks throughout the country, between the close and the beginning of business hours on successive days. It would be necessary to keep a supply of funds at the various branches throughout the country. Moreover, the requirements of the other banks for making provision for abnormal withdrawals of money by depositors would also be larger than in other countries. The physical concentration of reserves could not, therefore, be carried with safety so far as in smaller countries, and a somewhat larger reserve would be required in proportion to the total demand liabilities of the banks of the country.

Closely connected with the size of the country is the variety of its economic activities and the wide differences in stages of development reached in its different sections, especially in respect to the accumulation of capital. It would be extremely difficult for the management of a central bank to analyze correctly the business situation and to forecast the immediate future,—matters which are essential to a determination of the proper policy to be adopted at any particular moment. In this respect, however, the situation would perhaps not be more complex than that which confronts the management of the Bank of England on account of the international position of the London money market. A more serious difficulty

seems to be found in the distrust of, and even hostility towards, the Eastern financial centers, which still persists in those sections of the country which are primarily agricultural. This attitude is an inevitable consequence of the position in which the people of a newly settled region find themselves, when, in order to develop its resources rapidly, they have borrowed largely from distant capitalists. But the accumulation of capital, as well as the liquidation of debt, has been a notable feature in the recent economic history of the Western States, and already the traditional feeling towards the Eastern creditor has faded to a shadow of its former self. On the other hand, a less sectionalized but more diffused feeling against the methods of wealthy financiers has been created by the investigations and agitation of the last few years. The present juncture is an unfavorable moment for the establishment of a central bank, because men having the experience required for its management can hardly be found outside the circles of those who have been the subject of wide-spread doubt and discredit. It is to be feared that, in order to allay alarm from the two sources above mentioned, the details of organization would be prescribed and the powers of the management restricted in ways which might seriously impair its usefulness.

Were objections to a central bank solely of the kind which have been examined up to this point, it might be said with truth that every radical change must present difficulties as real and as serious. No one of the objections or all of them together could afford ground for the opinion that a central bank might not, at least in the course of time, give to our banking system those elements of strength and efficiency which it is agreed upon all hands are now sadly lacking. In the preceding paragraphs, however, we have by no means reached the heart of the problem. It is essential that we examine

the particular powers and devices made use of by existing central banks in the exercise of their peculiar functions. Only after the effectiveness of these powers and devices in varying circumstances has been determined, will it be possible to form a reasonably accurate estimate of the results which may be expected from a central bank in the United States.

The special functions of central banks may be grouped under three heads: they serve as fiscal agents of government; they have large powers of control over the currency through the more or less complete monopoly of note issue; and, finally, since they hold a large part of the reserves of the other banks, they are directly responsible for the foundation of the entire structure of credit. This last is by far the most important function of central banks. Indeed, in a general but very true sense, central banks may be said to have but this single function, —to insure the maintenance and smooth working of the systems of credit, of which they are the most important, tho not necessarily the most considerable, members. It rests upon central banks because the other banks, which hold little or no cash reserves, rely upon their deposits at the central bank and upon the expectation of being able to borrow from it through rediscounts or direct loans.[1]

This centralization of bank reserves has been everywhere a characteristic feature in the evolution of central banks. Historically, it is probable that it came about in large measure as a result of the monopoly of note issue and of the government business handled by them. Such is quite certainly the case with the Bank of England, the earliest central bank in date and the model for all others of its kind. Through its government business other banks were

[1] The London banks do not borrow directly from the Bank of England. They withdraw money lent to bill brokers, who in turn are obliged to borrow from the Bank. The difference is one of form rather than of substance.

inevitably brought into daily contact with it, and the convenience of an account upon its books became readily apparent. Again, the right of note issue, in a period when banking methods were undeveloped, was an advantage which, along with its government business, gave the Bank of England a position of unquestioned superiority, both in size and in prestige. From keeping a balance to keeping their entire reserve in the central bank required no essential change in the every-day methods of business of the other banks. This stage had been reached in England before the close of the eighteenth century, and for generations English bankers have held in their own vaults only such amounts of money as are required for every-day purposes,—till-money, as the English are wont to designate it. This custom was still further strengthened in 1854, when the plan was adopted, in the settlement of clearing balances, of simple transfers upon the books of the central institution. In other countries, virtually the same situation has been reached. Altho the other banks may hold a slightly greater amount of cash, they carry balances, larger or smaller, with the central bank, and are quite as dependent upon it to meet extraordinary requirements.

A somewhat analogous situation is familiar in this country. It was being developed before the Civil War from motives of business convenience, step by step with the more intimate commercial relations which improved transportation made possible between different sections of the country. Our national banking law crystallized this development at a point of somewhat less concentration than was reached by European banks without legislative restrictions. With us any unusual demand for money sooner or later involves withdrawals from New York, not indeed from any single New York bank, but from some one of the ten or twelve banks in that city which hold

practically all the deposits of outside banks. The situation of these banks, and in a minor degree that of the banks in other reserve cities, is similar to that of a European central bank, and the responsibilities incurred are of the same nature. A most striking difference is that the European central banks recognize this responsibility and understand the policy which they should adopt, while our reserve holding banks do not. The responsibility is apparently so scattered that it is not sufficiently felt.[1] Here the establishment of a central bank may seem a hopeful means of improvement, since it is obviously more easy to secure effective action from a small number of closely associated directors of a single bank than from the directors of many banks, especially when they are not all in the same locality.

It may be seriously questioned whether it is either practicable or desirable that reserves should be concentrated in the United States to the extent customary in Europe. The deposit liabilities of the banks of the United States are more than twice as large as those in any other country. Moreover, on account of the size of the country and the number of its banks, an exceptionally large reserve is required for a given volume of deposits. With the complete concentration of reserves the amount of money and the extent of business of the central bank would become portentously large. It seems more practicable that the banks should continue to hold at least as great a portion of their reserves in their own vaults as is now customary. The burden upon the central bank would be somewhat diminished, but not to such an extent as to weaken the force of comparison with existing central

[1] The concentration of reserves in the United States is greater than is often supposed. Six New York banks (the City, Bank of Commerce, Park, Hanover, First, and Chase) hold three-fourths of the bankers' deposits secured by the New York banks, and there are scarcely fifty banks in all the reserve and central reserve cities with bankers' deposits of more than $5,000,000. See what is said below on this topic at p. 412.

banks. Our central bank would doubtless be relied upon to supply unusual requirements for money, the other banks regarding the reserve held by them as a sort of permanent foundation of credit, not as something to be used.

A much more difficult problem presents itself with regard to that proportion of the reserves of banks which is now deposited with banks in reserve and central reserve cities. At present the national banks in the three central reserve cities alone hold about $600,000,000 of net bankers' deposits, and the banks of the reserve cities hold about two-thirds as much more. Whether all, a part, or none of these deposits are to go to a central bank is a matter of the utmost importance. Doubtless, in any circumstances, a part of these deposits would be retained by their present holders. Considerations of business convenience and the probability that the central bank, following the custom of similar institutions in other countries, would not pay interest, would tend to the continuance, to a considerable extent, of existing arrangements. No great change seems to be expected by those who urge a central bank, tho this is, perhaps, owing to a failure to give the matter careful consideration. Its fundamental significance will appear at a later stage in this discussion.

In the exercise of their function in relation to the reserve, the possession of government balances and the monopoly of note issue are valuable instruments in making effective the means adopted by central banks. But neither of these advantages, it should be noted, is essential to the working of a central bank. Government balances are at times so small as to be of little service, and in the case of the Bank of England the right of note issue is of no practical importance whatever, since the Bank of England note is virtually nothing more than a gold certificate. Even in countries where the central bank is able

to extend its credit in the form of notes, it is still true that the means used in the furtherance of the reserve policy are, in substance, similar to those of the Bank of England. The right of note issue, as will be seen later, is simply a valuable resource in the furtherance of a policy which would be adopted in any case. This is a matter which cannot be too strongly emphasized, since the proposal to establish a central bank in the United States is being urged primarily in order to secure a mechanism for the issue of notes.

In analyzing the operations of a central bank, three situations may be distinguished with regard to which, tho the general purpose is the same, the policy adopted is strikingly different. These three situations are: first, periods of normal business activity; second, periods of moderate financial strain; third, periods of acute strain and panic. In the following pages the activities of central banks will be studied in each of these situations, comparison being made from time to time with what may be reasonably expected from a similar institution in the United States.

I.

Activities in Normal Times.

The activities of a central bank in normal times are of a comparatively simple and even routine nature, not very different from those of the other banks about it. In some countries on account of statutory requirements, and in all countries from motives of sound policy, its loans and other investments are confined to those which are deemed of high quality. The high quality of the assets is not, however, insisted upon with the intention of converting them into money in times of emergency. A central bank is then the refuge of last resort for the other banks, and

any attempt to call in loans or realize on securities at such times would be directly opposed to the working principles of the central reserve banking system. It invariably happens at such times that the loans of central banks are largely increased.[1] The good quality of the assets in general is important because it gives that prestige which is half the battle for a central bank. A reputation for conservative, sound judgment is absolutely essential to the maintenance of universal faith in the strength of the central institution. For this reason, and even more in order to be able to meet the responsibilities of its position, it is equally essential that a central bank should hold a very large reserve against its credit liabilities. There is, of course, no precise proportion of reserve which is everywhere adequate amid varying circumstances. The general character of the economic activities of the country and the size of its entire credit structure must be the determining considerations for each central bank. In all countries with such institutions there has been a distinct tendency to maintain a larger reserve than was thought necessary twenty years ago. This seems to be due to a more clear recognition of their responsibilities, and because these responsibilities have increased with the growth of other banks and the more intimate relations between the markets of the world. After the Baring crisis in 1890 it was generally felt that the reserve of the Bank of England was too small. The proportion to deposit liabilities which, in normal times, had been in the neighborhood of 40 per cent., was therefore increased to rather more than 45 per cent. Even this proportion is now thought by many to be hardly sufficient. The Bank of Germany holds about the same proportion of reserve as does the Bank of England, and the reserve of the Bank of France,

[1] There is, indeed, one kind of loan to which this statement does not apply —the foreign bills held by many of the Continental central banks; but see p. 389.

for many years, has been notably greater than that of any other country.

The ability to earn reasonably satisfactory dividends, while maintaining these large reserves, may well be given a word of explanation. Central banks do not pay interest upon deposits, and where, as in the case of the Bank of England, large deposits are received from the other banks, a basis for remunerative business is secured. In Germany, and especially in France, the right of note issue provides the money for the reserve at practically no expense to the central banks, since notes may be substituted for money which would otherwise be required in every-day use.[1]

A highly important tho rather obvious consequence of the holding of large reserves should not be overlooked. Central banks do not in ordinary times make use of their entire lending power. They are a sort of reservoir of money and credit for use in emergencies. The other banks do lend to the full extent of their resources, and in the United States all of the banks follow that policy. The consequent absence of any reserve of lending power in the United States is a fundamental source of weakness in our system. Whether it can be best remedied through a central bank or in some other way is the central problem of this discussion.

In securing business in competition with other banks, a central bank experiences no difficulty when the available funds of the former are regularly insufficient to meet the demand for loans. Until quite recent times this was generally the case, and is still the constant situation in Japan and Russia. In western Europe generally the central banks have been able to secure only a diminishing proportion of the growing volume of banking business of all kinds. The resources of the other banks have increased

[1] An increase in the note issue of the Bank of England does not increase the banking reserve, because of the complete separation of the issue and banking departments since the Act of 1844.

to such an extent that, except when business is very active, they are able to satisfy the entire demand for loans. In England, France, and Germany there are now banks which, measured either by loans or deposits, are larger than the central banks of those countries. The central banks are obliged to compete with the other banks for business, and, as will be pointed out later, upon terms which place them at a serious disadvantage. This tendency has been most pronounced in England, but only because of the more complete development of its banking system. Between 1897 and 1908 the average deposits and the average reserve of the Bank of England, while fluctuating not a little from year to year, showed no appreciable growth, being about £50,000,000 and £25,000,000, respectively. During the same interval the deposits of the other banks in the United Kingdom increased from £720,000,000 to £850,000,000. The published figures do not permit an exact comparison of the growth of loans, but there is every reason to believe that the showing would be no more satisfactory from the point of view of the Bank of England. There has therefore been a decided falling off in the proportion of the reserve to the total deposit liabilities of all of the banks. The experience of the Reichsbank has not been more satisfactory, tho it has the advantage of being able to strengthen its reserve through the substitution of notes for coin in general circulation. In 1897 its average reserve was £43,000,000, but it was hardly able to retain this amount during the following ten years of irregular tho generally active business. The rapid industrial development of Germany in recent years has been accompanied by at least equally rapid expansion of credit by the other German banks.[1]

[1] W. Prion, Das deutsche Wechseldiskontgeschäft, contains by far the best account of the working of the German money market. For England, Bagehot's Lombard Street is indispensable; but upon the working of the banking system at present the reader should consult the admirable work which appeared only this year under the rather misleading title of The Meaning of Money, by Hartley Withers.

Not even the skilfully directed policy of the Reichsbank has been able to strengthen the foundation of the credit structure. The very considerable increase in the reserve of the Reichsbank during the last year is of no particular significance, since under any system, money commonly accumulates in the banks at times of acute depression. In France the reserve of the central bank has been notably increased during the last few years, but, it may be confidently asserted, not primarily or even largely because of special influence of the Bank of France. The industries of France change but little from year to year, either in volume or in general character. The accumulation of capital is extremely large, and there is constantly a surplus seeking investment. In France, as in other countries, the influences which in the long run determine its condition are largely beyond the control of the central institution.

This failure of central banks to increase their operations to an extent sufficient to retain a permanent proportion of the increasing total of banking business requires some detailed explanation. In part it is due to a relative increase in the kinds of business which central banks are unwilling to accept. The over-draft in particular has become to an increasing extent a favorite method of borrowing in the European business world. It has many of the advantages of the demand loan, familiar in American banking. The borrower pays only for so much of the loan as he actually uses. In all countries purely domestic business dealings seem to give rise to a relatively diminishing volume of commercial paper in the form of bills of exchange, the kind of paper which central banks are most ready to take. During the greater part of normal years, moreover, the central banks are experiencing increasing difficulty in securing any part of the business of the very highest class. This is largely owing to

the lack of flexibility in the terms upon which central banks are accustomed to accommodate borrowers. There are two official bank rates,—the rate of discount and a somewhat higher rate for loans. The market rates (that is, the rates of other banks and brokers) are highly flexible, corresponding to every slight variation in the character of the security, the duration, and other conditions of the loan. The best paper is therefore ordinarily not brought to the central bank, tho in Continental countries, shortly before maturity, it is often rediscounted in order to take advantage of the admirable collection facilities which these institutions have provided. The Bank of England has frankly recognized this situation, and for many years has followed the market rates in dealings with regular customers. The Reichsbank adopted the same policy for a number of years, but discontinued it in 1896, largely on account of agrarian protests.

The suggestion has frequently been made that, if in normal times the official rates were reduced to a level with the market rates, no difficulty would be experienced in securing all the business which a central bank might care to take. But this would not serve the purpose, because market rates would almost certainly recede still further. It is true that there are a number of long-established customs which give the official rates an indirect influence upon the market rates. In England and Germany, for example, the interest paid by the other banks upon time deposits, and the rates for certain kinds of loans,[1] fluctuate in a fixed relation to the official rate of discount. Even when the market is well supplied with funds, therefore, the market rates are seldom entirely uninfluenced by the official rate. But, if at such times the bank rates were further reduced, the market rates would

[1] In particular, rates on over-drafts and upon documentary foreign bills secured by perishable goods.

almost certainly experience still further decline, and the effort of the central bank to secure additional business of the highest class would be unsuccessful.

The growth of the business of the other banks has tended to increase the fluctuations from week to week of the business of central banks in quite normal years. This is especially noticeable at the end of each quarter of the year. The various payments and transfers of credits and money which everywhere occur at those times make it necessary for the market to resort to the central bank. The requirements for these purposes may not have increased relatively to the total amount of banking business, but they have increased when measured by the growth of the business of central banks. During the last two weeks of December in recent years of active business, the loans of the Bank of England have increased by upwards of £15,000,000,—an amount probably equal to half the loans of the bank at other times. In Germany the same phenomenon may be observed, with this difference,—that in London deposit credits are sufficient for the purpose, while in Germany, owing to the slight use of checks, either specie or notes are required. To meet this requirement, it is proposed, in the bill for renewing the charter of the Reichsbank now under discussion, to allow a temporary expansion of the untaxed issue of the bank at the end of each quarter of the year. Requirements of this nature are quite normal, and are met without much difficulty by central banks, since they can be foreseen, and because the central banks do not use their entire resources at other times. On the other hand, they afford evidence that the growth of business of the other banks is placing an increasing burden upon the central banks.

In the United States the difficulties of a central bank from the causes mentioned above would be considerably greater than in any other country. It would experience

great difficulty in procuring business of the highest class because it would be obliged to enter into competition with powerful banks which already occupy the field. Moreover, it is to be expected that weekly fluctuations in quite normal years would be far more violent than in any other country. The greater volume of credit transactions would by itself have this effect. Account must be taken also of the extent to which this is still primarily an agricultural country, and its economic activities are of a highly speculative and unstable nature.

After this outline of the normal activities of a central bank, we are in position to consider in somewhat greater detail the minor functions of issuing notes and acting as government fiscal agent. The utility of central banks in the latter capacity is clear and unquestioned. Public receipts and expenditures are handled at little or no cost to the government, and the money market is subjected to no serious inconvenience. Even when revenue is largely in excess of expenditure, there is only that temporary tightening of money rates always incidental to the shifting of credits. The market rate of discount is advanced more nearly to, or even to a level with, the bank rate, and the central bank secures a larger portion of the total current business. The amount of government funds is, in the countries now having central banks, seldom large enough to impose great responsibilities or to create alarm at the power which an enormous surplus might give. The budgets of most countries are designed with an eye to equality of income and outgo, and only towards the close of the fiscal year, or after the issue of a war loan, are government deposits inconveniently large. In England, France, and Germany government balances are usually between twenty-five and fifty million dollars. During the last four years the maximum in France was $78,000,000, and in England $99,000,000. In both coun-

tries the balance is kept from falling below $20,000,000 by the issue of short-term government obligations. Finally, it should be observed that, as government fiscal operations follow much the same course year after year, their disturbing influence is minimized because it can be foreseen.

In the United States, however, the situation is very different. Fluctuations in government money holdings over short periods are perhaps not more considerable than in European countries, but the average amount of such holdings has for many years been enormously greater, with the possible exception of Russia, and of Japan during and just after the recent war. Changes in our revenue laws are made at infrequent intervals, and appropriations are authorized with little reference to probable income. Fluctuations in the amount of government funds are therefore of a wholly different character from those in European countries. In 1905 the Treasury cash holdings,[1] exclusive of trust funds, and the $150,000,000 gold reserve, were nearly stationary. During 1906 and the greater part of 1907 there was a steady upward movement, which carried the amount of government money from about $240,000,000 to more than $390,000,000. In recent months the tendency has been quite as strong in the opposite direction, and in December, 1908, the Treasury held only $266,000,000. Throughout all these years the Treasury held more than the maximum balances of England, France, and Germany taken together, and for much of this time more than the total deposits of all kinds of the Bank of England.

In magnitude, permanence, and in the nature of their fluctuations, the balances of the United States govern-

[1] The figures in the text are in each instance rather more than a hundred million dollars greater than the monthly returns of available cash in the Treasury, which offsets against cash holdings such current obligations as disbursing officers' balances.

ment are clearly quite unlike those of other countries. Placed in a central bank, they would constitute a permanent fund of enormous proportions, the use of which would give the bank a power far beyond anything known in banking history. But the manner of putting this vast sum into general use would be equally without precedent. Without doubt there would be a general demand that the deposits be used with some degree of approximation to the population and the supposed needs of different parts of the country. At this point an insurmountable obstacle would be encountered. To lend directly to the business community would require an impossible number of branches. Lending at the relatively small number of branches which we have assumed might be established would not accomplish the purpose. Here the example of the Bank of England fails to supply a precedent because of what may be termed the lack of fluidity in our system of credit. In England, and indeed in all countries which have central banks, it matters little whether the central bank makes loans in a single place or generally throughout the country. If, for example, the Bank of England makes advances in London, it relieves the pressure for loans upon the other banks. They are then in position to lend more freely at any of their numerous branches where there may be an active demand. The entire country is served by the several thousand branches of less than one hundred banks, most of which have their head office in London. Similar concentration, and in some instances to an even greater extent, is found in other European countries. In the United States banks are not permitted to operate branches under the national and most State banking laws. Consequent absence of banking concentration rather than the absence of a central bank is the most fundamental difference between banking in this and in other countries. Elsewhere the

central bank is simply the final step in banking systems, which without it would in any case be highly centralized.[1] How fundamentally important is this preliminary concentration will appear in our analysis of every activity of central banks.

In order to distribute its funds widely, the central bank would be obliged to lend to at least as many banks as there are localities; and, since the selection of a single bank would give rise to charges of favoritism, the bank would be certain to lend to all the banks. There are now nearly seven thousand banks in the national system, and, if any distinct advantage were to follow, the State banks would doubtless generally enter the system. The central bank would be obliged to decide between the claims of fifteen thousand or more banks. To estimate the quality of the securities offered by the various banks would be no easy problem, tho slight compared with the difficulty of determining the amount to be lent to each bank. How determine the relative needs of a large New York or Chicago bank, on the one hand, and of rural banks in Wisconsin and Texas, on the other? The withdrawal of funds, when thought desirable upon general grounds, would be a yet more delicate undertaking. The withdrawal of credit from a single reservoir reduces the general level. If a given quantity is to be taken from thousands of reservoirs, it becomes necessary to consider the supply in each, and to fix upon those which can endure the loss without dangerous shrinkage. Consideration must also be given to the likelihood that complaints will be made that neighboring reservoirs have not contributed their fair quota. From whatever side the subject is approached there seems no escape from the conclusion that a central bank would not be able to handle

[1] There is, indeed, comparatively little banking concentration in Japan. But the Bank of Japan has unusual powers of control, owing to the scarcity of capital in that country. The other banks are constantly obliged to resort to it for loans.

the deposits of the government in such a manner as to give general satisfaction and escape general criticism. It is not improbable that they would have to be distributed in some more or less permanent fashion analogous to our existing arrangement. The possible advantage over our present system would be slight, and would be hardly perceptible if the present system were modified by the simple requirement that the Secretary of the Treasury should deposit in the national banks all surplus funds beyond a reasonable working balance.

An elastic currency is the panacea which has been most generally prescribed for our financial ills, and it is largely because a central bank is believed to be an effective means to this end that its adoption has been urged. This is not, indeed, always a function of central banks. The Bank of England cannot increase its note issues except by impounding an exactly equivalent amount of gold in its issue department. Elsewhere the monopoly of issue is subject to less drastic restriction, and the notes are a true credit currency, expanding and contracting with variations in business requirements. Confining our attention to the use of notes in normal periods and taking for consideration France, in which the check habit is not very general, it appears that the average volume of notes in circulation has steadily increased and is now nearly five thousand million francs, and the difference between the maximum and the minimum amount in circulation in a year is often as much as five hundred million francs. In England, where deposit banking is familiar to all, there are no such wide variations in the demand for currency, the amount of money of all kinds in circulation fluctuating within the extremely narrow limits of three million pounds. In the United States the use of checks is quite as general as in Great Britain, but the relatively greater importance of agriculture causes wider seasonal

variations in the demand for money. The steady growth of the check habit in purely rural communities seems, however, to be causing a relative decline in this demand. Notwithstanding the increased agricultural production and higher prices, it shows no tendency to increase, tho it varies much from year to year. The national bank returns for the last ten years indicate an autumnal requirement at most of about $50,000,000. A somewhat greater shifting of funds between banks doubtless occurs, as the banks in the crop-growing regions naturally increase their money holdings rather more than the actual outflow. In any event, our seasonal requirements are certainly well within the limits of the circulation of the Bank of France, and there is fair ground for maintaining that they could be supplied by an institution with similar powers, if there were no other obstacles beyond mere magnitude to be taken into the account.

Our difficulties would appear, as in the case of government deposits, as soon as the attempt was made to place the notes where they are really needed,—in agricultural sections of the country. It would be necessary to deal with each bank in the crop-growing regions separately. Further, if a central bank were to issue notes, the demand for them would not be confined to the crop-moving period or to banks in agricultural regions. When a single bank has the monopoly of the issue, the notes acquire somewhat more the full characteristics of money than is the case when notes are issued by many competing banks. In particular they are almost equally serviceable for purposes of reserve against deposit liabilities. It is reasonable to expect, therefore, that bankers generally would be eager to secure them. As in the case of government deposits, the central bank would be forced to decide between the conflicting claims of thousands of banks, each urging its own local needs. Once more the absence of

branch banking presents itself as a formidable, it would seem even insuperable, obstacle to the successful exercise of an important function of central banks of the European type.

Even if the notes were made unavailable for reserve purposes by statute, the general demand for them would not be greatly diminished. A bank securing the notes could easily substitute them for an equivalent amount of other kinds of money previously in general circulation, and retain the latter for reserve purposes. It would only be necessary to follow the existing practice with regard to the existing bank-notes, which are commonly selected from current money paid in to the bank for early payment over the counter. By this easy method $100,000 in notes could be used to secure $100,000 in gold or other reserve money, which would serve as a basis for several times that amount of loans and deposit liabilities.

It cannot be too strongly insisted upon that the experience of other countries with notes issued freely by a central bank affords no adequate indication of the probable effects of such an issue in the United States. There is a wide difference between Anglo-Saxon countries and the countries of Continental Europe in the extent to which checks are used, and consequently in the possibility of credit expansion in the form of deposits. Changes in the deposits of French or German banks, for example, are almost entirely due to the direct receipt or payment of cash or notes. In England and in the United States the principal cause of change in the deposits of commercial banks is the increase or decrease in the volume of loans. The borrower ordinarily wants a credit at the bank against which he can issue checks, and those who receive the checks have equally little occasion for actual cash. The significance of this difference can best be shown by an illustration. When deposits increase in a German bank,

we may be reasonably certain that they have more money to lend, and that, when they make loans, they are obliged to pay out more money or notes. When American banks have more deposits, it usually means that they have already increased their loans. In Germany, if a bank secures through rediscounts notes from the Reichsbank and makes further loans on its own account, it will find that, aside from stock exchange and other dealings of a similar description, it can lend but little more than the amount of the notes. In the United States the notes would serve, after being replaced by lawful money withdrawn from circulation as a basis for deposit credit to several times their amount. Something like this takes place under our present system, and it gives banks as a whole a sort of diffused profit from note issue which is not generally recognized.

It is highly improbable that the notes of a central bank would speedily return to it when once put out in circulation, except when the central bank contracted its loans. The process of contraction would be disturbing, because it would involve a contraction several times as great in the loans of other banks. The conclusion would seem to be inevitable that with a highly developed deposit credit system the note of a central bank is a dangerous instrument, tending towards inflation. It has apparently been some more or less well-thought-out reasoning of this nature that has led the best English opinion to oppose proposals that the Bank of England be allowed to issue a credit bank-note.

It may be questioned, moreover, whether it is entirely desirable that there should be a system of note issue so elastic as to free the banks from moderate seasonal requirements for actual cash. The deposit is an obligation for payment on demand, and the actual demand for cash from time to time serves to remind bankers of that

very important fact. It enforces a sort of taking account of stock, and brings home to the banks the necessity of keeping their house in order at all times. Where deposit banking is not general, doubtless credit in the form of notes must be elastic. But for countries like England and the United States restrictions on note issue exercise a much-needed restraining influence. A credit structure which cannot endure without perturbations the temporary withdrawal of, say, 5 per cent. of its cash foundation would seem to require some change in its business methods rather than devices for further credit expansion. Normal seasonal variations in credit requirements could be readily met if our banks were less given to the habit of lending to the full extent of their resources in months when the course of business gives them an abundance of cash.

II.

The Precautionary Stage.

The husbanding of resources which has been emphasized as an essential feature of the policy of central banks in normal times might be thought to belong to the second or precautionary stage of their operations. For purposes of exposition, however, there is some advantage to be gained by simply grouping in that stage actual steps taken by central banks to restrain the expansion of credit and to strengthen their reserves. The essence of the distinction is that in the first stage the central bank, however carefully it may husband its own resources, leaves the market free to follow its own course, while in the second stage it endeavors to subject the market to a certain measure of control.

In the exercise of this function the central bank seeks to govern the market by the wise combination of per-

suasion and control. A variety of devices are resorted to, in part dependent upon the circumstances of the particular case and in part the result of customs and traditions which have been developed in different countries. Some of these devices are entirely within the direct sphere of operation of the central bank, while others require the co-operation of the other banks or the control of their operations. The Bank of France relies largely upon the device, peculiar to itself, of a premium upon gold withdrawn for export. In Germany the Reichsbank is said to be able to prevent gold exports by agreement with other banks, even when there would be a clear and immediate profit from the operation. Many of the central banks facilitate gold imports by advances upon gold in transit. The Bank of England can within narrow limits change its buying and selling prices for gold in bars and for foreign coin. Most of the Continental central banks regularly hold considerable quantities of foreign bills, which can be used to check gold exports and to secure gold imports. This device is the main reliance of the Bank of Belgium; it is of very great importance in the case of the Bank of Austria-Hungary; and it seems to be regarded with increasing favor at the Reichsbank and the Bank of France. Its effectiveness would largely disappear if it were universally adopted. It is noteworthy that the bulk of the foreign bills thus held are upon London, to which the rest of the world seems to look more and more as the one certain and immediate resource in times of emergency.

One device, however, the sliding scale of discount, is made use of by all central banks, and, with hardly an exception, is of pre-eminent importance.

The primary object of an advance in the rate of discount is to influence foreign exchange rates, to check gold exports or to stimulate gold imports, by increasing

the investment holdings by foreign banks of bills drawn upon the country. A quite secondary object is to diminish the demand for domestic loans. Success is always dependent upon whether the market rate follows the bank rate. To bring this about is the most frequent, if not the most serious, task of a central bank. When the strain upon the reserve is merely anticipated or of moderate proportions, it is frequently difficult to make the market follow the bank. If the other banks have abundant funds and if the necessity of caution is not obvious, the immediate effect of the advance of the bank rate upon the market rate may be imperceptible. The central bank will then secure little new business. In countries where its proportion of the lending business is large, it is true that the increased demand for loans at the other banks will soon force up the market rate. But, as has already been pointed out, the business of central banks has become small in proportion to the total credit business in most countries. It has happened with increasing frequency that the outside market has been able to shoulder the entire lending business without advancing rates to the point desired by the central banks. In recent years both the Bank of England and the Bank of Germany have found it necessary with increasing frequency to deprive the market of its surplus funds. This is accomplished in England by the sale of government securities, and in Germany by the rediscounting of Treasury bills. This device has answered its purpose to a striking degree. Its effectiveness is a direct consequence of the narrow foundation of balances with the central bank, upon which rest the vast liabilities of the other banks. In London, for example, it is supposed that bankers' balances may amount to half the total deposits of the Bank of England, say £25,000,000. If these balances are reduced even by a million pounds through the sale

of government securities by the Bank of England,[1] the other banks are obliged to contract their loans and reduce their deposits by many times that amount, in order to preserve the customary proportion of balances to their credit liabilities. The credit structure is so delicately poised upon its foundation of Bank of England balances that it is sensitive to very slight influences.

Many English observers have questioned whether the extent to which the concentration of reserves has been carried does not seriously imperil the foundation of the entire financial structure. The heavy burden upon the reserve of the Bank of England makes the London money market exceedingly sensitive to even slight temporary influences, especially those which may cause the withdrawal of gold for export. The discount rate is advanced more frequently than would probably be necessary if reserves were larger. Repeated efforts have been made to secure united action among the London joint stock banks, looking towards the provision of some reserve in their vaults or a special reserve deposit at the Bank of England. Altho this change might strengthen the system in some respects, it is also probable that the market would then less easily be brought to follow the lead of the central bank in its discount policy. While the responsibilities of central banks are increasing, the most important instrument at their disposal in the performance of their heavy duties has not become more effective. No specific instance has yet occurred to show that the burden has become too great, probably because the principles which should govern a central bank have become more

[1] The balances of the other banks would almost certainly be reduced by this step unless the securities were sold to individual depositors of the Bank of England. If the securities were purchased by the other banks or by their customers, checks in payment would swell the clearing-house exchanges of the Bank of England. If they were sold to bill brokers or their customers, the result would be the same, tho there would be one or more additional transfers of credit required to complete the operation.

clearly understood by bankers and the public, and a tradition has been developed which makes it possible for the central bank in most instances to govern by persuasion rather than resort to force.

Since every unusual demand for money falls upon the central bank, it would be to its advantage, were that possible, to eliminate the dishonest and reckless management of particular banks. History does not afford any clear indication that central banks have been able to effect much in this direction. It might also be expected that something would be accomplished by example and precept to moderate general tendencies towards the dangerously rapid expansion of credit by the banks as a whole, but here also it would be difficult to cite specific instances of successful endeavor.[1] General speculative movements are less violent in Europe than in the United States, but this difference is properly ascribable to the greater opportunities for rapid development in a new country with large undeveloped natural resources. Germany, which in late years has been in manufactures and commerce virtually a new country, has experienced highly speculative movements, which the Reichsbank has been seemingly powerless to control. After all, a central bank can do little more than husband its own resources for the future, at a time when the other banks have abundant funds and a spirit of general over-confidence pervades the business community.

All the devices made use of by central banks, as they exist in other countries, in the precautionary stage of their policy have one common characteristic: they are designed to improve matters by influencing the foreign exchanges. The prevention of a foreign drain and the attraction of gold from other countries is the one object

[1] In the autumn of 1906 the Bank of England was able to place a slight check upon the enormous advances being made by London bankers to New York financiers by means of finance bills.

in view. Little direct influence is brought to bear to strengthen the domestic banking situation by reducing the aggregate of credit advances. Very high discount rates may reduce somewhat the demand for loans for purely domestic purposes, but not necessarily, or even probably, the demand for those which are most undesirable. Foreign borrowing alone is likely to be diminished to an appreciable extent by the ordinary advances in rates. The negotiation of finance bills by foreign bankers may be made unprofitable, and the holding of commercial bills for investment abroad may be increased. By this means the total volume of loans in a market constituted like that of London may be considerably diminished. The foreign trade and financial operations of the leading European countries are of enormous magnitude, both absolutely and relative to the total business of those countries. Many of the great crises during the nineteenth century were precipitated, and at least in part caused, by events occurring in other parts of the world with which Europe has close financial relations. The purely domestic and economic activities of old countries are comparatively stable, and seldom give occasion to inordinate speculation. Any arrangement, therefore, which succeeds both in strengthening the central bank and also in placing a somewhat restraining influence upon foreign speculative operations, is one which affords protection against the most serious weakness threatening the European financial world.

When we turn to the United States, we find a situation strikingly and fundamentally different from that which we have just described. Our financial troubles are of domestic origin. Not one of our crises has been precipitated by events occurring in other countries.[1] Our for-

[1] The Baring failure in 1890 greatly increased the usual strain of the autumn months in New York; but, the economic conditions were far from satisfactory in the United States, no crisis occurred.

eign trade and investments, compared with those of European countries, form a small part of our total economic activities. Our exports of foodstuffs and raw materials have a broad and fairly stable market, while our imports, largely of luxuries, respond quickly to every change in the consuming power of the people. We have no appreciable amount of capital invested abroad, and a diminishing proportion of capital employed in the country is of foreign origin. Moreover, we do not finance any considerable share of our foreign trade. Bills drawn against our exports are usually discounted in Europe, and our imports are secured through commercial letters of credit, which also give rise to bills which are accepted and discounted in European money centers. The element of weakness in our foreign exchange position is found in the enormous temporary obligations incurred during the periods of active business by American bankers through the issue of finance bills. If a central bank is to strengthen our credit structure, it is certainly not to be accomplished by the attraction of further amounts of foreign money through high discount rates. In only one way does it seem possible that a central bank might secure assistance from foreign sources without an addition to our current obligations. It might conceivably in normal times hold a large amount of foreign commercial bills instead of following the present custom of sending them abroad at once for discount. This policy would, however, be regarded as a menace in European markets to be guarded against at all cost. It would not in the slightest degree enable the central bank to exert a restraining influence on domestic business activities. It would be simply a device to draw more money from Europe in emergencies,—a power which is already the most disturbing factor in the European money market.

Our financial troubles are almost wholly due to causes

which may be traced to our domestic economic activities. In periods of prosperity the expansion of loans is peculiarly rapid, partly because of the abundant opportunities for development in a new country and in part because of the general use of deposit credits. It would be incumbent upon a central bank to control or moderate this tendency, especially when borrowers were using the proceeds of loans in hazardous speculative enterprises or were relying upon them to supply deficiencies in working capital. Raising the rate of discount after the European practice would not avail. It does not have any considerable effect in this direction even in Europe, except upon loans of foreign origin.

Even such a slight moderating influence as an advance in the rate of discount may have elsewhere upon the volume of purely domestic loans would probably be lacking in this country, because there is every reason to fear that the central bank could not make its rate effective. In preceding pages we have seen that a variety of influences are present in countries with central banks, which give them some control over market rates. Among these may be mentioned prevalent banking customs, a delicately poised money market, fluidity of credit, and the possession by the central bank in normal times of some share in the current loans to individuals. No one of these factors taken alone is indispensable, but in the absence of any one of them the others must be correspondingly more powerful. Banking customs, such as the relation of the interest rate on deposits to the bank rate, cannot be created off-hand. They were the product of slow growth at a time when central banks occupied a commanding position and when other banks were in the course of development.

The fluidity of credit is absent in this country, and will remain absent while we wisely continue to prefer banks

managed by persons with extensive local knowledge to branch banks subject to bureaucratic managers, acting under general rules laid down at a distant head office. For this reason also we cannot expect our money markets to be subject to the comparatively slight and distant influences exerted by a central bank. It would be necessary to concentrate bank reserves to such an extent that every banker would feel that his safety depended upon the situation of the central bank. Whether a central bank conservatively managed could secure business of the highest class is by no means certain. We have already noted the difficulty experienced by central banks in Europe, as a direct result of the growth of other banks. In this country we already have a highly developed banking system, and, if a central bank is to be successful, it must succeed in taking business away from existing banks, leaving them, it may be added, with loans somewhat inferior in quality. From every point of view it seems extremely unlikely that the sliding scale of discount could be made effective in this country, and, even if that were possible, it does not seem to be a device which is likely to strengthen our credit structure to any appreciable extent.

It is significant that, altho the results expected are similar to those achieved in Europe, the various plans[1] which have been proposed for a central bank in this country are for a kind of bank quite unlike anything found elsewhere. While exhibiting considerable differences in details, the plans are in substantial agreement as to essentials. It is proposed to establish a bankers' bank pure and simple, which is to transact business principally, if not solely, with the government and the banks, both of which are to share in its ownership and management.

[1] See, *e.g.*, Report of the Comptroller of the Currency, 1907, p. 71, and P. M. Warburg, "A Central Bank," in Proceedings of the American Economic Association, 1908.

It is also to have the power to issue notes and is to hold the bankers' deposits now held by banks in reserve and central reserve cities. Presumably also it would secure deposits from banks in the central reserve cities.

The advocates of this proposal have been impressed with the defects in our banking system in times of emergency and have sought earnestly for a remedy, but, unfortunately, they have overlooked the effects of a bank of this kind in normal times and especially when precautionary measures may serve to minimize an emergency and even prevent its occurrence. A bank organized upon the lines described above would have one fundamental defect, so serious as to destroy its power of usefulness. It would not be able to exert a restraining influence upon the expansion of credit, because it would have no means of carrying out a precautionary policy. Bearing in mind what has been said on previous pages,[1] the consequences of an issue of notes by a bank of this kind will be readily understood. Is it not certain that, in the eager search for funds in times of active business, the other banks would resort to it for heavy loans? Doubtless a considerable measure of accommodation would have been thus granted if we had possessed such a central bank in the years before the crisis of 1907, even tho it had been managed with far more conservatism than we have any reason to be certain of securing at all times.[2] Every dollar thus borrowed would have been an addition to the extension of credit at a time when restraint was needed, not expansion. The central bank would have been creating a certain amount of credit expansion, which its later power of contraction could certainly not have ex-

[1] See pp. 383–8.

[2] Recent history affords no assurance that the government influence in the management of a central bank would be always found on the conservative side. See the article on "The Banks and the Treasury under Secretary Shaw," by Professor A. P. Andrew, in this Journal for August, 1907.

ceeded and probably could not have equalled, because the volume of credit cannot be largely diminished without serious disturbance. The power to issue notes by a bank of this kind would be a positive evil unless it were strictly reserved for use only upon occasions of actual emergency.

The possession of the bankers' deposits might at first sight be expected to give the proposed central bank some control over the expansion of credit. If it should secure the bulk of the bankers' deposits now held in reserve and central reserve cities, it would then keep unquestionably a larger reserve against these deposits than is held by existing banks. With these deposits and the government balances a central bank might be able at the outset to acquire a commanding position in the banking world. The other banks generally might be forced to resort to it for accommodation, and, since the loans of the reserve and central reserve city banks would have been greatly diminished on account of the loss of bankers' deposits, no net expansion of credit might follow. It is by no means certain or even probable, however, that the other banks would remain permanently dependent upon the central bank after a sufficient time had elapsed for new capital to enter the banking field. From that moment its power of restraint would cease.

It is unnecessary to discuss further the possibilities of a bank conceived upon these lines. Aside from the extremely doubtful results which might follow from its activities, it is unthinkable that any one, much less those concerned with the management of our existing banks, would be prepared to see our entire credit system become constantly and directly dependent upon a single institution. It has been given passing notice, because it illustrates very clearly the practical impossibility of securing through a central bank anything like effective guidance

or control of the credit operations of a system composed of many thousands of banks.

There remains a further alternative for consideration. Altho a central bank might be unable to exert a restraining influence upon the expansion of credit, it may be urged that by refraining from the issue of its notes in ordinary times and by maintaining a large reserve it would increase the power of the banks to cope with emergencies. A familiar illustration will make evident the undesirable consequences which would follow the establishment of a central bank of such restricted scope. For many years we have had something of the kind in the independent Treasury system. During much of its history it has held large surplus funds which have been turned over to the banks in times of real or fancied need. The banks have not been obliged to depend entirely upon their own resources, and have not, therefore, given sufficient heed to indications of approaching emergency. Let us not delude ourselves with the notion that a central bank of this kind, which would be a mere crutch, would be able to achieve results similar to those which have been secured in countries where the central bank is the very heart of the credit organism. Some share in the loans made directly to the business community or a condition of constant dependence for the other banks (as in Japan) is absolutely essential, if a central bank is to be able to exert a restraining influence. Otherwise it will simply play the rôle of the unwise parent whose indulgence weakens the sense of responsibility and lightens the penalty for lack of foresight.

III.

The Activities of Central Banks during Crises.

Analysis of the activities of central banks during periods of acute financial strain cannot be separated from the consideration of their normal and steady operations. If in normal times and during periods of moderate strain such an institution does not seem likely to fit into our system, it becomes obviously out of the question to seek by this means a remedy for more acute financial disturbances. But the success which has crowned the efforts of central banks in handling crises suggests the wisdom of studying their methods, with the object of applying them to our own situation, if perchance they may prove to be independent of any particular form of banking organization.

In times of acute financial panic the central bank plays an active dominating rôle. Upon it rests the responsibility for maintaining specie payments, and also in large measure for the continuance of lending facilities to the business community. This responsibility was not clearly recognized, and the policy which should be followed in such situations was not clearly understood in the latter part of the eighteenth century and the early years of the nineteenth century. In some instances, loans were restricted, with disastrous consequences not only to business, but to the central banks as well. In other instances, loans were granted freely, but without that concomitant advance in the rate of discount required to influence foreign exchange rates and to drive away borrowers whose needs were not urgent.[1] For the last forty years at least the policy which should be followed has been

[1] MacLeod's Theory and Practise of Banking contains the best account of English banking experience during crises before 1860. See chapters ix., xi., and xii.

clearly understood, largely owing to Bagehot's reiterated expositions in the *Economist*, finally embodied in more permanent form in his *Lombard Street*.

The policy of liberal loans, tho at high rates, and the payment of money or notes to all depositors who for any reason whatever may require cash, are now everywhere recognized as the guiding principles of action in emergencies. More recently still another method of relief has been adopted in practise, if not in theory. Central banks have at times taken the lead, as in the Baring instance, in arrangements for the conservation of the assets of large banks which are not hopelessly insolvent, and by preventing sudden liquidation have confined the disturbance within narrow limits. In this matter the central bank has no very marked advantage over the clearing-house organization in American cities. The machinery for united action will hardly be set in motion in the absence of some person of commanding influence in whom the business community has confidence. In carrying out the crisis policy as to loans and cash, a central bank does not require any previous agreement with the other banks. Whether the same course of action can be followed in the United States, where in the absence of a central bank such agreement is necessary, and, if so, with equally good results, is the problem which now presents itself for examination.

In one important respect the course of American crises has been strikingly unlike many of those in Europe. The foreign exchange situation has not been the storm center in the United States. Even in 1893, when our currency was redundant through causes beyond the control of the banks, the export of gold was an influence in precipitating the crisis, primarily because the intention as well as the ability of the government to maintain the gold standard was doubtful. Moreover, we have never

experienced any difficulty in securing abundant supplies of gold from Europe after the outbreak of crises, with the solitary exception of the first weeks of the crisis of 1893. As early as 1857 we were able to import over $6,000,000 in the course of a few weeks,—an amount which was equal to about half the reserves of the New York banks at that time. The enormous importation of about $100,000,000 in 1907 is within the recollection of all. It has been argued that the heavy importations of 1907, as well as those during some of the other crises, are in part to be attributed to the currency premium, which made it possible to import gold at a profit, even when exchange rates were above the normal export point. But it is important to observe that gold exports were engaged before there was any premium upon currency. Moreover, only so far as foreign exchange rates which were quoted in the medium of certified checks failed to advance *pari passu* with the depreciation of the checks, was the currency premium a factor in the situation. After all, the movement of commodities and foreign credits are the principal influences determining gold movements, and neither of them is strengthened by the suspension of cash payments by the banks and the consequent currency premium.[1]

Much importance has been ascribed by those who favor a central bank to the absence of the domestic bill of exchange and of the bank acceptance in the American business world. It is urged that satisfactory results through the operations of a central bank cannot be secured unless the bill of exchange comes into general use, and that its absence is a fundamental cause of the

[1] The gold imported during the crisis of 1907 was almost entirely secured through the discount of trade bills. During the spring and summer months it had been impossible to negotiate the usual amount of anticipatory bills in Europe. Consequently, the enormous autumn sales of American commodities abroad provided the means of payment for the gold which was imported.

lack of liquidness in the assets of the banks.[1] But, in drawing this conclusion, form rather than substance has been regarded. Bills of exchange are more liquid than other assets in emergencies, because the central banks are more willing to take that form of security. The main essential is that a central bank shall not have exhausted its power to lend before the emergency occurs. The experience of the clearing houses in connection with the issue of loan certificates shows that our banks have abundant security to offer, if there were some reservoir of unused credit at which they could be exchanged for some kind of acceptable purchasing power. But a central bank is not the only possible means of providing this reservoir of credit. Fortunately, a more simple means is at hand. It is only necessary that the banks which hold banker's deposits adopt the practise of maintaining in normal times somewhat larger reserves than is now customary.

With regard to the continuance of loans during crises the defects in the working of our banking system appear at first sight extremely serious. Not only during crises, but also in years of less serious strain, rates for loans have soared to extraordinary levels far beyond anything known in other countries; and at times reports are cur-

[1] The bill of exchange has a certain vogue, because it arises out of business transactions, the termination of which will in due course provide the means of payment. This is by no means always the case, however. The accommodation bill was more than a bugbear to bankers of former generations, and in recent years the bill, accepted by one bank and discounted at another bank, has provided the means for highly speculative undertakings. The extensive use of such bills in Germany before 1907 weakened the entire credit structure, altho through a happy combination of good fortune and skilful management the threatened collapse was avoided. See W. Prion, Das deutsche Wechselgeschäft, pp. 150, 189, 242, and Deutsche Oekonomist, 1908, pp. 456, 489.

In the United States the bank acceptance would be peculiarly subject to abuse on account of the large numbers of banks. Moreover, a firmly established business usage would seriously restrict the use of the commercial bill of exchange. Firms of the highest standing regularly take all the trade discounts which are offered for prompt payment, borrowing, if necessary, from the banks on their notes. Promissory notes are mostly given in payment for commodities by firms whose resources and credit are relatively inferior, and the situation would not be altered if the bill of exchange were to take the place of the note.

rent that no loans can be secured upon any terms. More careful examination of the facts will show that this impression is not a little exaggerated. The banks in general have always taken care of their regular customers, often exacting no advance on the rates at which they have been accustomed to lend. The borrowers who have experienced great difficulty are those who depend entirely upon the distribution of their paper to many banks through note brokers, and those who borrow upon call or time against collateral securities for investment or speculative purposes. The statistics of the loans of the national banks which appear in the reports of the Comptroller of the Currency afford conclusive evidence that no wholesale and rapid curtailment of loans has taken place even in months of extreme panic. Between May and October in 1893 the total loans of the national banks were reduced from $2,161,000,000 to $1,843,000,000, slightly more than 15 per cent. But during that period, chiefly because of failures, the number of banks was reduced from 3,830 to 3,781, thus accounting for at least a part of the loan reduction. Moreover, this contraction was apparently spread pretty evenly over the entire period of five months. The July returns show that loans had been reduced by $140,000,000, leaving $180,000,000 to be accounted for in the three succeeding months. In 1907 there were comparatively few bank failures, and the general economic situation was far less unsatisfactory. Between August and December, 1907, loans were reduced from $4,678,000,000 to $4,585,000,000, almost exactly 2 per cent. In many of the cities of the country there was a slight increase in loans. In New York the loans of the national banks increased from $712,000,000 to $775,000,000, altho, on account of the difficulties of the trust companies, it is probable that there was no actual increase of loans in that city.

The contraction of loans would therefore seem to be wholly incommensurate with the commotion in the loan market which characterizes our crises. The banks evidently make an effort to convert their loans into money, but this effort is not successful. Each bank follows the course which is effective when a small number of banks find it necessary to diminish their liabilities. Let us take the call loan as an example. When a few banks demand the payment of these loans, the brokers, to whom they are principally made, secure loans elsewhere, and the banks calling the loans are paid. The total volume of call loans is not much changed. Within narrow limits it may be possible to reduce the aggregate of such loans by sales of securities to persons able to pay for them outright. It is also possible to secure additional margins from customers for whom brokers are carrying securities. But when all banks call their loans, they cease to be convertible into money. Purchasers who might be able to pay for securities outright become frightened, and little or no contraction takes place, while panic and alarm are generally increased. It usually becomes necessary to form a money pool, as was the case in the first week of the panic of 1907. This is nothing more than an agreement among banks to bring about what the banks in ordinary times do without agreement. In European countries the call loan, as well as other loans, is convertible, not because it is paid, but because the central banks stand ready to supply the necessary credit to borrowers whose obligations must be met. In this country it should be more clearly understood that here also no class of loans, not even call loans, can be diminished suddenly to any considerable amount. A given volume of business cannot be deprived of that amount of credit with which it has been customarily carried on. Attempts to do so involve direct loss, not only to borrowers, but to

the banks, and they also weaken public confidence, which more than the cash reserve is the real foundation of any system of credit.

Another cause of violent fluctuations in the rates for call loans is quite independent of our banking methods. In all European stock exchanges, dealings are with reference to fixed settlement dates, either fortnightly or monthly. Our method of daily stock delivery involves constant shifting of loans, which is a serious menace in times of crisis. It explains more than all other causes the fluctuations in call loan rates in this country. It also causes sudden and unnecessary fluctuations in the quoted prices of shares, and stimulates the attempts of speculators to corner particular stocks.

The clearing-house loan certificate is a device similar in its purpose to the money pool. The latter secures the continuance of loans from day to day for a particular purpose. The clearing-house loan certificate is designed to insure the continuance of loans of all kinds throughout the period of an emergency. It was devised after the crisis of 1857, which brought home to the New York banks the disastrous consequences of the policy of loan contraction to themselves, as well as to the business community. The banks had been unable to agree upon a liberal loan policy, because of the fear of unfavorable clearing-house balances, which would have to be met by banks making loans freely to banks which pursued a more selfish policy. The clearing-house loan certificate makes it possible for banks to lend freely, without fearing the loss of cash on this account. It takes away much of the advantage which might be derived by banks which restricted their loans. The issue of these certificates does not in the slightest diminish the obligation to pay individual depositors their money on demand, or the obligation to pay banking depositors outside the clear-

ing-house association. It is a device which in its origin had reference primarily and solely to the lending policy, not to the reserve policy of the banks. The clearing-house loan certificate is absolutely essential, in the absence of a central bank, to secure united action as regards loans during a crisis, and it has never failed to be entirely adequate for the purpose. Unfortunately, the use of this device seems to be thought by many to involve, or at least to hasten, the suspension of cash payments by the banks. If this be, indeed, one consequence of its issue, it must be confessed that the remedy is quite as bad as the disease which it is designed to cure.

That the use of the clearing-house loan certificate does not necessarily involve the suspension of cash payments is quite certain. Loan certificates were issued in 1860, and the banks did not suspend; and again in 1861 without suspension until early in 1862, when suspension ensued from causes entirely independent of their issue. They were issued at the end of 1863, in 1864, and more recently in 1884 and in 1890. On three occasions only their issue was closely followed by suspension,—in 1873, in 1893, and in 1907. On all of these occasions, suspension began when the banks required their depositors to stamp upon their checks the ill-omened words, "Good through the clearing house." Instead of confining the clearing-house loan certificate strictly to payments between banks, the banks have virtually required their individual depositors to accept a sort of payment which the banks could satisfy by means of a loan certificate. The actual use of the clearing-house certificate as currency in some of the Western and Southern cities carries suspension but little further.

The issue of loan certificates does not diminish the amount of money held by the banks of a city taken as a whole. If the stronger banks make use of the certificates

in meeting clearing-house balances, the weaker banks may be forced to suspend, and general suspension is then pretty certain to follow. To meet this danger, provision was always made, until 1884, for the equalization of reserves when the issue of clearing-house loan certificates was authorized. In 1873, it is true, partial suspension was not prevented by this means. But the New York banks then paid out a much larger proportion of their reserves than in later crises; the currency premium was of shorter duration and it did not reach so high a level; payments to outside banks were continued and the movement of commodities was not seriously interrupted by the dislocation of the domestic exchanges.

Suspension, when limited to payments to individual depositors whose requirements are largely local, is comparatively harmless. But our city banks have another class of depositors to whom their obligations are, at least in New York, nearly as great as those to their individual depositors. Reference is, of course, made to deposits of outside banks. In dealing with them, the city banks have resorted to suspension pure and simple. Most of the requirements of the individual depositor can be served with checks payable through the clearing house. But when a distant bank demands the return of the reserve which it has on deposit with the city bank, nothing short of actual cash will serve the purpose. Failure to meet such demands fully and without delay precipitates suspension everywhere. Moreover, it has an incomparably greater disturbing effect upon general business activities. Purely local business, aside from pay-rolls, can be carried on after a fashion with checks, but, when the domestic exchanges are dislocated, the movement of goods between different parts of the country soon comes to a standstill.

When city banks accept bankers' deposits, they incur

a heavy responsibility analogous to that of the central banks in Europe. While our banks have recognized the necessity of a liberal loan policy in time of crisis, they have not learned the unwisdom of hoarding their reserves. The national banking law, with its reserve requirements, seems to have blinded our people to the principal purpose and right uses of a reserve. It is not designed to insure a certain percentage of return to depositors in case of failure. A reserve is designed for the use of the many solvent banks in times of emergency, and not for the few insolvent banks. The payment of money to depositors, regardless of what proportion of reserve to liabilities may remain, is the one means which the experience of all banks shows to be effective in allaying panic. In adopting this remedy, the power of issuing notes is advantageous, but not indispensable. It saves the specie reserve from depletion, but in its absence it is only necessary to keep in ordinary times a larger reserve than would otherwise be required.

The panic of 1907 afforded convincing evidence that the fundamental cause of our repeated suspension of cash payments in time of panic is the ignorance of our bankers of the only method which experience in other countries has shown to be uniformly successful in allaying financial panics. During the last two weeks of October the reserve of the New York banks fell from $265,000,000 to $224,000,000, and there was then a deficit of $39,000,000 below the 25 per cent. reserve requirement. Thereafter the actual reserve was allowed to decline only $9,000,000, and during the two remaining months of the year, while a premium was being paid for money, the reserve was even increased to $251,000,000. An illuminating indication of the unsound principles upon which the policy of our banks was based is found in a recent address of the President of the New York clear-

ing-house at the time of the crisis, which is so significant that it may be quoted at some length:—

> The Clearing-House Committee knew by experience that the dissipation of the New York banking reserve, upon which practically the credit volume of the nation rests, would alarm the nation, intensify the panic, and greatly prolong the period of recuperation. . . . New York bankers have been severely criticised because they did not more fully respond to the demands of country correspondents by shipping currency against balances. To have fully honored the demands that were pouring in from all sections of the country would have dissipated our banking reserve in a fortnight. How could it be replenished? Were the interior bankers sending currency to New York? What would have been the effect upon the country if the New York banking reserve had been entirely depleted? It would have so intensified the panicky feeling that wide-spread commercial disaster would have resulted. . . . The $53,000,000 deficit in our banking reserve occurred in less than ten days after the failure of the Knickerbocker Trust Company, and was caused by the shipment to interior institutions of the larger portion of that amount in that short time.[1] We kept the door of our treasure house wide open, until for the good of the whole country it became necessary to everywhere close it. It never was fully closed; currency shipments continued in a restricted way throughout the panic, and a large number of our banks kept up their counter payments as usual.[2]

A contrast with the action taken by the Bank of England at the same time is most striking, and far from flattering to American bankers. At the time of suspension, gold imports had already been engaged, and there was every indication that they would assume large proportions.

[1] As a matter of fact, the reserve deficit was primarily due to the local situation in New York City. On account of the Trust Company situation the clearing-house banks increased their loans, and consequently their deposit liabilities, by $70,000,000 during the last two weeks of October. The reported shipments of currency to the interior not offset by receipt of government money amounted to only $4,000,000, so that most of the net loss of $40,000,000 was unquestionably due to payments in the city itself.—AUTHOR'S NOTE.

[2] Commercial and Financial Chronicle, October 10, 1908, Bankers' Convention Section, p. 34.

The Treasury was increasing its deposits with the banks, and a considerable addition to the bank-note circulation was also being made. There was therefore a large addition to our currency in sight. On the other hand, the reserve of the Bank of England at the beginning of the panic was only £24,000,000, and it was reduced after two weeks to £17,000,000, largely through withdrawals for export to the United States. There was not, however, the remotest thought in London that the Bank of England might suspend cash payments, though the Governor of the Bank of England might have reasoned with perhaps more justification, after the manner of the president of the New York clearing-house. The actual amount of money held as reserve in the banking department of the Bank of England, and even in the issue department, was much smaller than the reserve of the clearing-house banks, and the means for increasing that reserve were by no means more certain.

We seem to have made a sort of fetich of the legal percentage of reserve, giving it an utterly unreal importance as something to be maintained to the sacrifice of every other consideration. We need an elastic reserve policy far more than an elastic currency. The demand for more notes is simply a demand for a roundabout contrivance for purposes which could be directly attained if we would but use our reserves in time of crisis.

The fact that there are central banks in Europe and a group of reserve-holding banks in New York does not alter in the slightest the nature of the policy to be pursued. The failure to adopt proper methods seems to be due not so much to inability as to a failure to recognize the responsibility of their position by the New York banks which hold bankers' deposits. Local responsibilities are clearly perceived, and properly so, as is indicated by the various money pools organized during the recent panic

to provide money for stock exchange purposes and to assist certain trust companies. Had a similar method been adopted to meet the demands from outside New York City, it is probable that cash payments would have been generally maintained, and the derangement of the domestic exchanges avoided, with all its accompanying loss to the business community. The difficulties of the situation were in one respect distinctly greater than would present themselves in Europe. It is impossible to make use of personal arguments to convince thousands of country bankers of the unwisdom and inadvisability of some of their demands for money during periods of financial strain. A central bank in this country, however, would be confronted with exactly the same difficulty. More and more, as we have seen, central banks rule by persuasion,—a method which is possible because of the concentration of management and responsibility which has resulted from the growth of branch banking.

We already have far more centralization of banking power in New York than is generally realized. Before the crisis of 1907 the six largest New York national banks held net bankers' deposits of $305,000,000 out of a total of $410,000,000 of such deposits held by all the national banks of the city. It is somewhat disconcerting to find that these banks, which held a reserve of $140,000,000 in August, 1907, still held $111,000,000 in December, 1907. There is no indication that these banks made any serious effort to provide their banking correspondents with the funds which they required during the crisis. The responsibilities incurred by a bank which receives bankers' deposits were not realized, nor were those deposits protected by a sufficient reserve. The reserves of the six large banks were no greater in proportion to their credit liabilities than those of the New York national banks whose business is of a purely local character. Insufficient reserves

against bankers' deposits are clearly one source of weakness in our present system. It is because so large a proportion of its deposits are placed in its keeping by other banks that the Bank of England keeps a large reserve. A legislative requirement of a greater reserve would, however, be of doubtful service, because of the tendency to regard a legal reserve as something on no account to be utilized. Voluntary action by the banks looking towards a larger reserve in ordinary times would certainly have much better results. To facilitate this step, banks should be forbidden to pay interest upon bankers' deposits. After the crisis of 1873 a committee of the New York clearing house reported strongly against the payment of interest upon bankers' deposits.[1] It was pointed out that such payments forced the New York banks to lend up to the hilt in July and August, altho contraction in subsequent months was absolutely certain because of crop-moving requirements. Unfortunately, the proposal was too conservative to secure the support of the more "progressive" bankers. Another advantage would be likely to follow from this measure. Outside banks are accustomed to deposit in New York and other cities funds largely in excess of their reserve requirements at times when they are unable to lend them at home at customary rates. These excess deposits are peculiarly unstable, and they tend to an accumulation of funds in our money centers which fosters unwholesome speculation.[2]

In conclusion, the following observations may be made with some confidence. A central bank does not appear

[1] This illuminating report should be better known. It will be found in the Commercial and Financial Chronicle, November 15, 1873, and in the Bankers' Magazine, December, 1873.

[2] It is estimated that at the present time (April, 1908) the interior banks have on deposit with the New York banks quite $100,000,000 beyond their reserve requirements. Altho it is certain that these funds will be drawn upon as soon as business activity is resumed, the clearing-house banks show a surplus reserve of less than 1 per cent. of their credit liabilities.

to be either required or well suited to relieve our financial ills. On account of the absence of branch banking it would not be able to handle the government funds in a satisfactory fashion or to provide an elastic note issue. Branch banking is an essential preliminary, if we are to have a central bank of anything like the European type, and there are powerful objections to such a change, the discussion of which does not fall within the scope of this essay.

The causes of financial troubles in the United States are in large measure peculiar to this country. Certain general causes of financial disturbances, such as the highly speculative character of many American economic activities, are beyond the control of the banks, however organized. Our stock exchanges might well adopt the European method of periodical settlement dates. As for the banks, a more definite recognition of the responsibility incurred by those who hold bankers' deposits is needed. They should hold larger reserves in ordinary times, but this will avail little unless it is accompanied with a more intelligent understanding of the policy required in time of crisis. If this is too much to expect, the immediate remedy would seem to be a reduction in the proportion of reserves which may be deposited by outside banks in reserve and central reserve cities. That proportion does not seem excessive in itself, but the repeated failure of our city banks to maintain cash payments in the past has shown that deposited reserves are practically unavailable in an emergency. It has also given rise to a feeling of general distrust in the community, not so much of the solvency of the banks as of the possibility of securing money in time of financial stress. In all countries at such times some depositors withdraw their money, and hoard it from unreasoning fear. In the United States there are also withdrawals by prudent

depositors who wish to be absolutely certain that they shall have money needed in their affairs, and by others who are influenced by the prospects of reaping a profit in a few weeks from the sale of money at a premium. Repeated suspensions have established a tradition which is an ever-present source of weakness, and which can only be broken by the successful endurance of the strain of a crisis by the banks. Some provision for an emergency circulation under conditions which would make resort to it reasonably feasible might possibly prove useful; but, above all, it should be repeated, a more intelligent conception of the purposes of a banking reserve is required.

O. M. W. SPRAGUE.

HARVARD UNIVERSITY.

THE VARIABILITY IN THE DISTRIBUTION OF WEALTH AND INCOME.

SUMMARY.

There is no generally accepted method of measuring the concentration of wealth, 416.—The methods of Lorenz, 417, Pareto, 419, and Watkins, 427, explained and analyzed.—The coefficient of variability, as used by statistical biologists; suggested as a good measure, 429.—Application of that measure to income statistics, 436, and to wealth statistics of Massachusetts, France, and the United Kingdom, 440.—Conclusion, and summary of the features of the different measures of variability, 447.

I.

BEFORE there can be any general agreement concerning the tendency in the distribution of wealth and income, two conditions must be fulfilled: first, adequate and reliable statistics; and, second, a scientific and generally understood method of measuring concentration. At the present time neither of these conditions is fulfilled. Wealth, income, and wage statistics are very meagre; and the articles of Messrs. Lorenz, Holmes, and Watkins in Nos. 70, 71, 72, and 81 of the Quarterly Publications of the American Statistical Association demonstrate that there is no generally accepted method of measuring concentration of wealth. It is the object of this paper to consider the various methods of measuring the inequality of the distribution of wealth that have been suggested, and to apply those methods to the available statistics.

Professor Lorenz has pointed out the mathematical inaccuracy of certain commonly used methods, and has suggested a graphic solution. Given the number of individuals holding estates of varying size, Professor Lorenz would arrange them in order, poorest to richest. He would then plot points on cross section paper whose abscissas are the percentages of the total wealth held and whose ordinates are the percentages that the holders

of such wealth bear to the total number. A curve would then be drawn through such points. Equality of distribution would give a series of points in a straight line. The amount of inequality would be measured by the amount of deviation of the curve from the straight line. Dr. Watkins notes that "Mr. Lorenz uses hypothetical figures, and thus fails to perceive the limited practical value of the particular species of graphic method that he prefers." [1]

The writer has applied the method to the Massachusetts Probate Returns for the four periods 1829–31, 1859–61, 1879–81, and 1889–91, with the result shown in Chart I.[2] The curve for the period 1829–31 shows the least

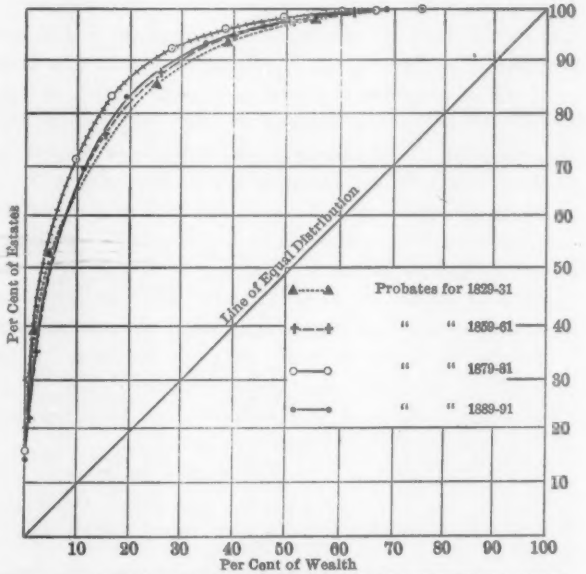


CHART I.—APPLICATION OF THE METHOD OF LORENZ TO MASSACHUSETTS PROBATE RETURNS.

[1] Publications of American Statistical Association, No. 31, p. 33 (foot-note).

[2] Twenty-fifth Annual Report of the Bureau of Statistics of Labor, Massachusetts, 1894, p. 265.

bulge, except at the lower extremity, where it shows next to the greatest. Hence, according to this method of measurement, the least concentration exists among these estates. The periods 1859–61 and 1889–91 come next with about equal concentration, and the period 1879–81 has the highest concentration. All the curves are nearly coincident, for the lower 50 per cent. of the estates and for the most concentrated 40 per cent. of the wealth. The method is defective in not allowing comparison at these points. Again, the method requires that a comparison of the bulge of the curves be made by the eye, many times an inconclusive test.

In his turn Dr. Watkins suggests measuring concentration by the slant of certain curves.[1] Suppose that in any community we have given the number of estates as large as $1,000, the number of estates as large as $5,000, as large as $10,000, and so on, for two or more different periods. Dr. Watkins would obtain a curve for each period by plotting points whose abscissas are the logarithms of the numbers of estates, each of which estates is as large as the designated amount, and whose ordinates are the logarithms of the designated amounts. That is, the logarithm of the number of estates of $1,000 or over and the logarithm of $1,000 would be corresponding abscissa and ordinate. "The steeper of two curves," says Dr. Watkins, "is the one which expresses the greater concentration."[2] An illustration of the kind of curves obtained by application of Watkins's method is shown by Chart II.

The method used by Dr. Watkins is a variation of that developed by Professor Pareto. The exact connection between the two will appear upon consideration of the latter.

[1] Publications of American Statistical Association, No. 81, p. 34.
[2] Ibid., p. 34.

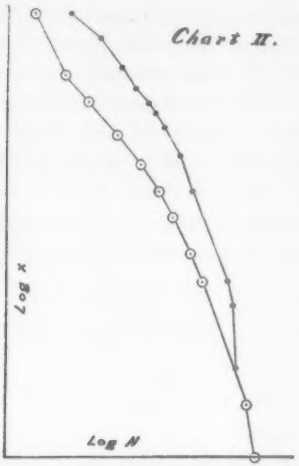


CHART II.—APPLICATION OF WATKINS'S METHOD TO BRITISH ESTATES OF £100 OR OVER IN 1901–02 TO 1905–06 (UPPER GRAPH WITH SOLID POINTS) AND FRENCH ESTATES OF 2,000 FRANCS OR OVER IN 1903–04 (LOWER GRAPH WITH CIRCLES).

II.

Professor Pareto, in his study of incomes, has observed that, if N represent the number of individuals having an income of x or greater, then the function $N = \frac{A}{x^{\alpha}}$ will fit the statistics closely, where A and α are constants to be determined from the given data. This law of the distribution of incomes is a purely empirical one, no *a priori* reason for it being given. Written in the logarithmic form, the equation becomes $\log N = \log A - \alpha \log x$, which, if $\log x$ be plotted as abscissa and $\log N$ as ordinate, is the equation of a straight line having a slope equal to $-\alpha$. Professor Pareto has suggested that α be used as a measure of the inequality of distribution.[1]

[1] Pareto's equation can be used only to represent the distribution of those incomes which decrease in frequency as the size of the income increases. Hence,

A numerical illustration may make clear the significance of the various terms in Pareto's equation. It is evident that A indicates the number of individuals earning one unit or more, for, if one be substituted for x in the equation, then, regardless of the value of α, $N = A$. Suppose that we have two communities of 1,000 individuals each, with incomes of one dollar or more distributed according to Pareto's law. Suppose, further, that for the first community $\alpha = 2$ and for the second community $\alpha = 3$. Inserting these values in $N = \frac{A}{x^{\alpha}}$, we have the following frequency tables (decimals omitted):—

COMMUNITY I.

($\alpha = 2$ and $N = 1{,}000$.)

Income.	*Number in Income Group.*
1 and less than 2	750
2 " " " 3	139
3 " " " 4	48
4 " " " 5	23
5 " " " 6	12
6 " " " 7	8
7 " " " 8	4
8 " " " 9	4
9 " " " 10	2
10 " " " 15	6
16 " " " 25	2
26 and upward	2
Total	1,000

COMMUNITY II.

($\alpha = 3$ and $N = 1{,}000$.)

Income.	*Number in Income Group.*
1 and less than 2	875
2 " " " 3	88
3 " " " 4	21
4 " " " 5	8
5 " " " 6	3
6 " " " 7	2
7 " " " 8	1
8 " " " 9	1
9 and upward	1
Total	1,000

it cannot be used to represent the usual distribution of wages, in which the number of wage-earners increases until a "modal" wage is obtained, and then decreases as wages increase.

It is to be noticed that the smaller value of α gives a wider range of distribution. This is true in general. The median, quartiles, and deciles can be computed easily by the use of the formula, by inserting the proper values for N and solving for x. The median of incomes over one unit is found by substituting $\frac{A}{2}$ for N; the quartiles, by substituting $\frac{3A}{4}$ and $\frac{A}{4}$; the deciles (lowest to highest), by substituting $\frac{9A}{10}, \frac{8A}{10}, \ldots\ldots\ldots \frac{A}{10}$. For the illustrations given we have the following results:—

	Community I.	Community II.
First quartile (Q_1)	1.155	1 101
Median	1.414	1.260
Second quartile (Q_2)	2.000	1.587

Substituting the quartile values in Bowley's measure of dispersion, $\frac{Q_1 - Q_2}{Q_1 + Q_2}$, we get 0.268 and 0.181 as the measures of dispersion for communities I. and II., respectively. This would indicate that the smaller value of α goes with the greater inequality of distribution.

That Professor Pareto's law apparently describes the distribution of incomes with a remarkable degree of accuracy is shown by its application to the statistics of income in Prussia for the years 1892 and 1902.[1] The points on Charts III. and IV. are located by plotting as abscissas the logarithms of the lower limits of classes of incomes from 900 marks upward, and as ordinates the logarithms of the numbers of incomes equal to or greater than such lower limits for the two years 1892 and 1902, respectively. Taking Pareto's equation, $\alpha \log x - \log A + \log N = 0$, the values of α and $\log A$ were computed by the writer such that the sum of the squares of the distances of the

[1] Zeitschrift des Preussischen Statistischen Bureau, 1904, p. 263.

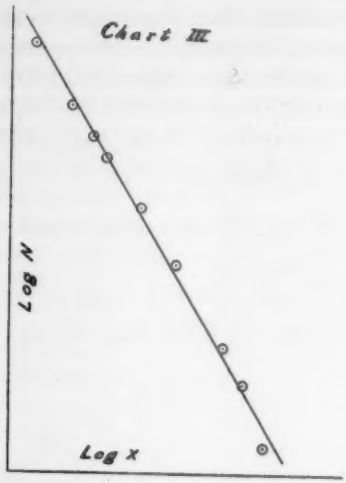


CHART III.—APPLICATION OF PARETO'S METHOD TO PRUSSIAN INCOMES OF 900 MARKS OR OVER IN 1892.

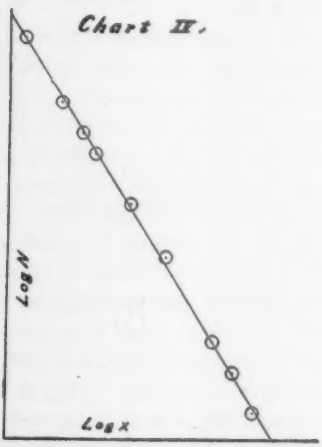


CHART IV.—APPLICATION OF PARETO'S METHOD TO PRUSSIAN INCOMES OF 900 MARKS OR OVER IN 1902.

given points to the straight lines be a minimum. The respective lines about which the points are grouped are the lines best fitting the points according to the least square criterion. The equations of the lines are:—

$$1.656 \log x - 11.3395 + \log N = O \text{ for } 1892$$

and

$$1.570 \log x - 11.1767 + \log N = O \text{ for } 1902.$$

If inequality in the distribution of incomes increases as α decreases, then the inequality increased during the decennial period considered.[1]

That Pareto's law does not describe the distribution of estates as closely as it does the distribution of incomes is at once evident upon reference to Chart V. The solid points are located by the statistics of estates or portions of estates of £100 or more liable to estate duty in the United Kingdom for the five-year period 1901–02 to 1905–06. The circles are located by the statistics of French successions of 2,001 francs and over in 1903 and

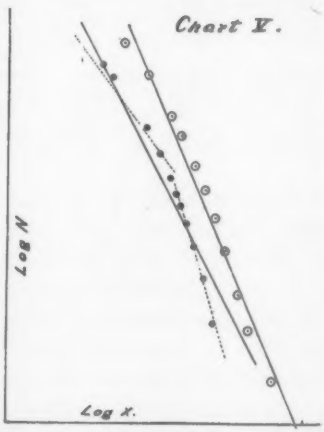


CHART V.—APPLICATION OF PARETO'S METHOD TO THE FRENCH AND BRITISH STATISTICS USED IN CHART II.

[1] See note on p. 449.

1904. In neither case is the "fit" nearly as good as it was for Prussian incomes. The dotted lines are the least square lines for the British estates of from £100 to £50,000, and from £75,000 upwards, respectively. Even tho the French and British data were fully comparable, a comparison of the values of α for the two series would not indicate the relative amount of concentration because of the decided variation of the points from a straight line. Thus the only reason that Pareto gives for the adoption of α as the measure of concentration—namely, the closeness with which the points group themselves about a straight line—fails for these statistics. A comparison of the values of α for the two sets of statistics thus means nothing.

Taking only those values of £10,000 or more from the British statistics, and of 250,000 francs or more from the French statistics, we have the configuration shown in Chart VI. The value of α for the British estates is

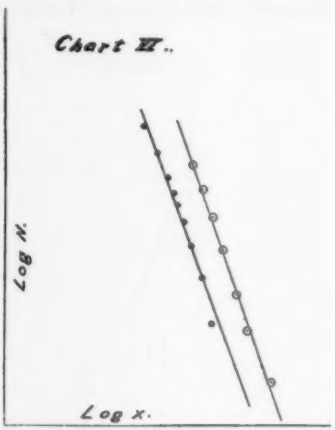


CHART VI.—APPLICATION OF PARETO'S METHOD TO BRITISH ESTATES OF £10,000 OR OVER IN 1901–02 TO 1905–06 (GRAPH AT LEFT WITH SOLID POINTS) AND TO FRENCH ESTATES OF 250,000 FRANCS OR OVER IN 1903–04 (GRAPH AT RIGHT WITH CIRCLES).

1.407, and for the French estates is 1.422, indicating a slightly greater variability among British estates.

Before making any further application of Pareto's method, it is desirable to determine the degree of accuracy with which the equation $N = \frac{A}{x^{\alpha}}$ represents the statistics. The simple observation of the closeness of fit of the points in Charts III. and IV. to the straight lines there given is not a sufficient test of accuracy, since the co-ordinates of the points are logarithms, and an error in a logarithm gives a much larger error in the natural number. The relation between the errors in numbers and in the logarithms of those numbers is shown by the following table:—

1% error in	100	makes 0.216%	error in log 100.
	1,000	" 0.144%	" " log 1,000.
	10,000	" 0.108%	" " log 10,000.
	100,000	" 0.086%	" " log 100,000.
	1,000,000	" 0.072%	" " log 1,000,000.
10% error in	100	makes 2.06%	error in log 100.
	1,000	" 1.37%	" " log 1,000.
	10,000	" 1.03%	" " log 10,000.
	100,000	" 0.83%	" " log 100,000.
	1,000,000	" 0.69%	" " log 1,000,000.
25% error in	100	makes 4.84%	error in log 100.
	1,000	" 3.23%	" " log 1,000.
	10,000	" 2.42%	" " log 10,000.
	100,000	" 1.94%	" " log 100,000.
	1,000,000	" 1.61%	" " log 1,000,000.

In order to test the accuracy of Pareto's method for those statistics for which the accuracy seems to be the greatest, the writer has used the Prussian income statistics. The procedure was as follows:—

1. Pareto's equations were computed by the least square method for Prussian incomes of (*a*) 3,000 marks or more in 1892, (*b*) 3,000 marks or more in 1902, and (*c*) 100,000 marks or more in 1902. The resulting equations are given in Table I. The data used in computing the equations are given in columns (2) and (5) of that table.

TABLE I.

Table showing accuracy with which Pareto's equation, $\alpha \log x - \log A + \log N = O$, gives the numbers of incomes in the various classes of incomes received in Prussia in 1892 and 1902.[1]

	1892.			1902.				
(1) Class.	(2) Actual Number Reported.	(3) Number Estimated from Equation No. 1 given below.	(4) Per Cent. of Error in Estimated Number in Column (3).	(5) Actual Number Reported.	(6 Number Estimated from Equation No. 2 given below.	(7) Per Cent. of Error in Estimated Number in Column (6).	(8) Number Estimated from Equation No. 3 given below.	(9) Per Cent. of Error in Estimated Number in Column (8).
(Marks.)			%			%		%
900 to 3,000	2,118,969	2,596,400	+22.6	3,309,696	2,791,500	—15.7	7,256,000	
3,000 to 6,000	204,544	275,900	+35.0	291,341	332,800	+14.4	743,300	
6,000 to 9,500	55,561	67,800	+22.0	77,636	87,310	+12.5	178,800	
9,500 to 30,500	46,092	50,482	+9.5	64,737	69,875	+8.1	130,180	
30,500 to 100,000	9,034	7,256	—19.7	13,205	11,395	—13.6	17,974	
100,000 to 500,000	1,555	1,083	—30.4	2,594	1,948	—24.9	2,569	—1.0
500,000 to 1,000,000	72	54	—25.0	108	114	+15.6	122	+13.0
1,000,000 to 2,000,000	27	17	—37.1	44	38	—13.6	38	—13.6
Over 2,000,000	4	8	+100.0	16	20	+25.0	17	+6.2
Total	2,435,858	2,999,000	+23.1	3,759,377	3,295,000	—12.3	8,329,000	—

Equation No. 1 computed from incomes in 1892 over 3,000 marks is $1.668 \log x - 11.4037 + \log N = O$.
" No. 2 " " " " " 1902 " " " " " $1.560 \log x - 11.1263 + \log N = O$.
" No. 3 " " " " " 1902 " 100,000 " " $1.702 \log x - 11.9486 + \log N = O$.

[1] Statistics from Zeitschrift des Preussischen Statistischen Bureau, 1904, p. 255.

2. In the equations thus computed the lower limits of the classes of incomes were inserted, and the numbers of incomes equal to or greater than such amounts were found.

3. The number of incomes in each class was then readily found by subtraction. These results are given in columns (3), (6), and (8) of Table I.

4. The per cent. of error in the number estimated to the actual number in each class was computed, and appears in columns (4), (7), and (9) of the table.

The percentage of error found is surprisingly large. Among the 1892 incomes of 3,000 marks or over, the percentage error in the various classes ranges from —37.1 to +35.0, except in the highest class, where the error reaches +100 per cent. Among the 1902 incomes of 3,000 marks or more the percentage error in the various classes ranges from —24.9 to +25.0. Even among the 1902 incomes of 100,000 or over the percentage error ranges from —13.6 to +13.0.

The preceding analysis shows that the accuracy of Pareto's first approximation is apparent and not actual. Pareto's method is not to be relied upon in comparisons where the difference in the amount of variability is not great.

III.

Chart II. gives the graphic representation of British estates of £100 or over and French estates of 2,000 francs or over, according to Dr. Watkins's method. The solid points are located by the British statistics, and the circles by the French statistics. Dr. Watkins's method is a slight variation of that of Pareto, obtained by simply interchanging ordinate and abscissa. The slope of the curve joining the points is taken as an index of variability. This test, as used by Dr. Watkins, is to be applied whether

or not the points lie along a straight line. Thus, in order to measure variability, it is necessary to estimate the relative slopes throughout the curves, a method that may result in much difference of opinion. The test is uncertain and inconclusive. The method of Pareto, from which this method is derived, is meant to be applied only in those cases where the points arrange themselves along a straight line. In such cases the values of α can be computed and compared. On the other hand, Dr. Watkins applies his method, however the points be situated, and offers no numerical measure of variability. That this leads to difficulties and inconsistencies will be shown later.

The objections to Dr. Watkins's method may be summarized as follows:—

1. The exact meaning of the test is not evident. As the author himself says, "Just what the degree of difference is between two series of numbers so compared is not obvious."[1]

2. The comparison of slopes of the curves has to be made entirely by the eye, which is a very unreliable scientific instrument. No numerical measure is offered. If, in comparing two curves, the second is steeper at one point than the first, and not so steep at another point, there is no way of telling the net result.

3. If the average size of the estates within a class change or if the largest estates should increase indefinitely in size, the slope of the curve would not change. That the average size of the estates in any one class does change considerably from year to year is brought out by the British statistics given in Table XI. The average amount of the estates over £1,000,000 varies from £1,000,000 in 1838 to £3,022,000 in the last period. This decided change does not affect the slope of Watkins's curve, as it would if the slope were a true measure of concentration.

[1] Publications American Statistical Association, No. 81, p. 33.

4. The effect of the smaller estates in the comparison of slopes does not seem to be given its true importance. The lower part of the curve is left out in several cases by Dr. Watkins in making his comparisons. Thus in the comparison of Massachusetts probate statistics for four periods, 51 per cent., 35 per cent., 83 per cent., and 27 per cent., respectively, of the number of estates are omitted in constructing the curves.

All of the methods which have been considered in the preceding analysis will be applied later in connection with the discussion of still another method of measuring distribution which will now be developed.

IV.

Mathematicians and astronomers have long had occasion to use an index of variability. In measuring any physical quality a large number of times by any instrument, however accurate, the astronomer finds that the resulting measurements are not all alike, but show variations or errors.

> The errors here referred to are the small accidental errors which necessarily affect all human observations, owing to the imperfection of the senses and of the instruments employed, as well as to any unfavorable conditions under which they are used. Such are as likely to be errors in excess as errors in defect, and hence in the long run tend to counteract each other.[1]

If the observer be untrained, the instrument crude, and the conditions unfavorable, then the variation among the measurements taken will be great. If the observer be trained, the instrument refined, and the conditions favorable, then the variation among the measurements taken will be correspondingly small. The necessity of finding a numerical index of variation among measurements is evident. Astronomers have adopted as their

[1] Greene, Spherical and Practical Astronomy, p. 115.

index of variability the square root of the mean square of the deviation of the individual measurements from the arithmetic average of the measurements. This quantity has been termed the standard deviation, usually represented by the Greek letter σ.[1] The *precision* of any set of measurements varies as the reciprocal of the standard deviation.

The statistical biologists have also found it necessary to measure variation. Evolution, according to the Darwinian theory, is dependent upon variability among individuals. "Here in variety, the various deviations from the racial type, we find the material for selection."[2] The standard deviation used by the astronomers has been adopted as the measure of variability for measurable biological characteristics. As Karl Pearson says,

> other measures of variability have been devised, some of which are occasionally useful, but for theoretical and practical reasons the standard deviation may be considered the best. It is not hard to find, and it occurs and recurs in all sorts of investigations.[3]

[1] Let σ = standard deviation,
n = number of measurements,
X = any measurement,
$X_1 \ldots\ldots X_n$ = the individual measurements,
m = the arithmetic mean $= \dfrac{X_1 + \ldots\ldots + X_n}{n}$
x = deviation of any item from the arithmetic mean.
$= X - m$.
$x_1 \ldots\ldots x_n$ = deviation of the measurements $X_1 \ldots\ldots X_n$ from the arithmetic mean,

Then $\sigma = \sqrt{\dfrac{x_1^2 + x_2^2 + \ldots\ldots + x_n^2}{n}}$,

or $\sigma = \sqrt{\dfrac{\Sigma x^2}{n}}$ (Σ stands for "the sum of such terms as").

If each of the individual measurements occurs several times, say X_1 occurring f_1 times, X_2 occurring f_2 times, and so on, where $f_1, f_2, \ldots\ldots f_n$ stand for the frequencies, the formula becomes

$$\sigma = \sqrt{\frac{f_1 x_1^2 + f_2 x_2^2 \ldots\ldots + f_n x_n^2}{n}}, \text{ or } \sigma = \sqrt{\frac{\Sigma f x^2}{n}}$$

where $n = f_1 + f_2 + \ldots\ldots + f_n$.

[2] Karl Pearson, The Grammar of Science (2d edition), p. 384.

[3] Ibid., p. 387.

The statistical problem before the economist in determining upon a measure of the inequality in the distribution of wealth is identical with that of the biologist in determining upon a measure of the inequality in the distribution of any physical characteristic. In order to determine the variability of the stature of men in a certain community, the investigator would need a statistical table giving the number of individuals of the varying heights. Such a table is called a frequency table. From this frequency table the standard deviation could be found easily. In order to determine the variability of the income or wealth of men of any community, such statistics would be substituted for those of stature.

That the standard deviation actually does measure inequality of distribution can be understood fully only by computing it for statistics, hypothetical and actual, and noticing the change following a change in the distribution of the measurements. Let us consider the following set of hypothetical statistics:—

Daily Wage.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
The number receiving such wage in:										
Period I.	120	30	20	13	7	4	2	2	1	1
Period II.	100	50	15	20	15					

Total number of wage-earners in each period = 200.
Average daily wage in each period = $2.

Our object is to obtain a numerical measure of the inequality of distribution of the wages in each of the two periods. The entire range of wages in Period I. is from $1 to $10, and in Period II. the range is from $1 to $5. Within each range occurs the variation. However, the range alone does not adequately measure the variation. The inequality in distribution depends upon the number of persons receiving the indicated wages as well as upon the range. The total daily amount of wages paid to the 200 wage-earners of each period is $400. The average

wage is $2 per day. It is evident that, if every one of the 200 wage-earners should receive $2 per day, there would be no inequality in distribution. The measure of inequality under such circumstances *ought* therefore to be zero. Inequality begins as soon as some receive more and others receive less than the arithmetic average wage. The first step in figuring the standard deviation is to obtain the deviation of each wage from the arithmetic average, which deviations are given in column 3 of the illustrations. Column 4 of the illustrations contains the product of each deviation and the number of wage-earners having such deviation. Column 5 is obtained by taking the product of corresponding items in columns 3 and 4. The square root of the total of column 5 divided by the number of wage-earners (200) gives the standard deviation. The standard deviations in the two illustrations, 1.664 and 1.285, are indices of the variability of the two groups of statistics.

ILLUSTRATIONS.

I.

1. Wage (X).	2. Frequency (f).	3. Deviation (x).	4. fx.	5. fx^2.
1	120	−1	−120	120
2	30	0	0	0
3	20	+1	+20	20
4	13	2	26	52
5	7	3	21	63
6	4	4	16	64
7	2	5	10	50
8	2	6	12	72
9	1	7	7	49
10	1	8	8	64
Total	200	—	—	554

$$\text{Standard deviation} = \sqrt{\frac{\Sigma fx^2}{n}}.$$

$$= \sqrt{\frac{554}{200}}.$$

$$= 1.664.$$

$$\text{Coefficient of variation} = \frac{\sigma}{n} .100 = 83.2.$$

II.

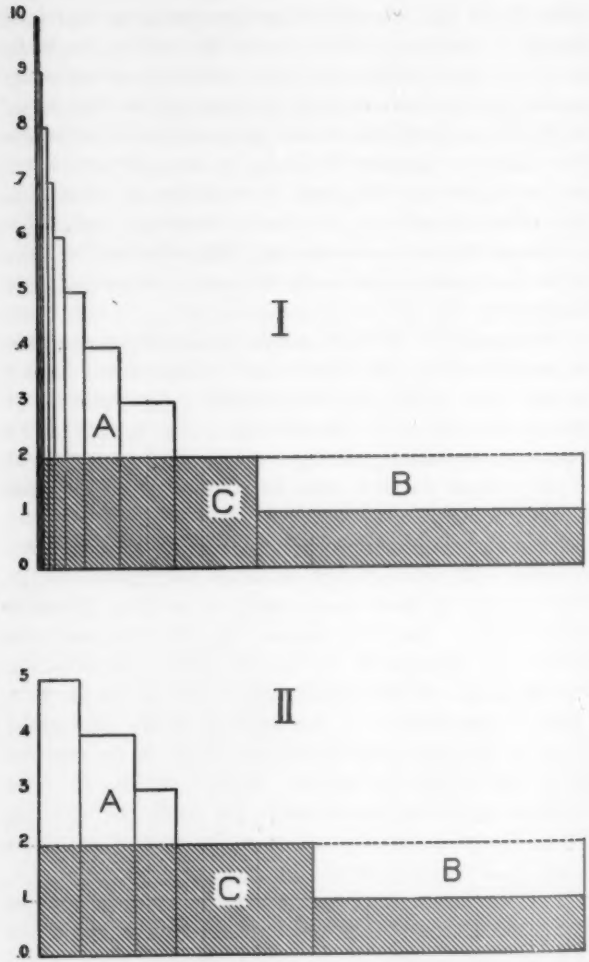
1	100	−1	−100	100
2	50	0	0	0
3	15	+1	+15	15
4	20	2	40	80
5	15	3	45	135
Total	200	—	—	330

Coefficient of variation = 64.2.

However, if the average daily wage had not been the same ($2) in the two cases, a comparison of the standard deviations would not have shown the relative variability. In order to obtain measures which are comparable, no matter what the arithmetic average may be, the standard deviation should be divided by the arithmetic average. This ratio (the standard deviation to the arithmetic average) multiplied by 100 gives the *coefficient of variability*. The arithmetic average and the coefficient of variability are complementary measures: the first indicates the type, while the second indicates the amount of variation from that type.

The manner in which a change in the statistics affects the coefficient of variability may be understood better by referring to the following graphic representation of the figures given in the illustrations. The heights of the rectangles appearing in Figures I. and II. correspond to daily wages received, and the widths are proportional to the numbers receiving such daily wages. The rectangles are arranged from left to right in order of their altitudes. The area of each rectangle corresponds to the total amount of daily wages received by some group of wage-earners. The area enclosed by the axes and the broken line corresponds to the total daily wages of the 200 workmen. A horizontal dotted line is drawn at a height corresponding to the average wage. The areas *A* and *B* are equal respectively to the sum of the positive and of the negative deviations. Area *A* = Area *B*. The standard deviation, and therefore the coefficient of variability, does not only depend upon the *sizes* of the areas *A* and *B*, but also on their *shapes*.

Consider Figure I. Suppose that the total amount of wages and the number of wage-earners remain fixed, but that the distribution of the wages change, what would be the effect on the figure? If the wage-earners receiv-


10
9
8
7
6
5
4
3
2
1
0
I
A
C
B
5
4
3
2
1
0
II
A
C
B

ing \$3 per day be reduced to \$2 per day, and the wages of the \$4 and \$5 men be increased one dollar each, the coefficient of variability for the new distribution would be 90. If twenty of the wage-earners receiving \$1 per day be reduced to nothing per day, and the wages of the \$4 and \$5 men be increased one dollar each, the coefficient of variation would be 95.5. In both cases the change means a greater concentration of wages. In the first case there was a shifting of the wages among those receiving more than the average, but that shifting was away from rather than towards equality of distribution. When, as in the second case, the increase of wages of those already receiving more than the average is at the expense of those receiving less, the tendency towards inequality is obviously doubly great. As the concavity of the jagged line (tops of rectangles) becomes greater, the inequality in distribution must be greater.

That a uniform percentage increase or decrease in all wages will not affect the coefficient of variability is easily demonstrated. If each wage be multiplied by a, the arithmetic average (m) will be multiplied by a, and therefore each deviation (being $aX—am$) would be multiplied by a. The standard deviation becomes $\sqrt{\frac{\Sigma f x^2 a^2}{n}}$, or $a\sqrt{\frac{\Sigma f x^2}{n}}$, and the coefficient of variability becomes $\frac{a\sigma}{am}$ .100, or $\frac{\sigma}{m}$ .100.

Likewise it may be demonstrated that, if the *number* in each group of wage-earners be increased by a given percentage, the coefficient of variability will be unchanged. Suppose each frequency to be multiplied by b, the total number of wage-earners will be bn. The standard deviation will be $\sqrt{\frac{\Sigma b f x^2}{bn}}$, or $\sqrt{\frac{b\Sigma f x^2}{bn}}$. Since the arithmetic

average and standard deviation are unchanged, the coefficient of variability will be unchanged.

V.

Professor Henry L. Moore has applied the above-described method of measuring variability to the most complete wage statistics that have been collected in the United States,—those in the "Employees and Wages" volume of the Twelfth Census.[1] The following table gives the number of employees, average weekly wage, and coefficient of variability for the thirty industries selected:—

	1890.	1900.
Number of laborers	104,923	160,055
Average weekly wage	$11.57	$11.52
Coefficient of variability	45.9	43.5

Both the average weekly wage and the coefficient of variability decreased during the decennial period. The decreased variability in the group of laborers considered may be due to the labor unions in their effort to equalize wages, to the further introduction of machinery, and the decrease of highly paid skilled laborers, or other reasons. Whatever may be decided upon as the *cause* of the decrease of variability, it is to be noted that Professor Moore has shown that the variability of the wages of this large group of laborers considered was less in 1900 than in 1890. This is a fact that must be considered in any complete study of the position of the wage-earner.

It would be extremely illuminating if we could obtain the tendency as to variability of wages over a long period, say from thirty to fifty years. As Professor Moore points

[1] Political Science Quarterly, March, 1907, p. 61.

out,[1] there are numerous important questions that can be answered only by such an investigation. The only series of wage statistics in the United States that covers an extensive period, and which is in such form that the coefficient of variability can be computed, is that of the Aldrich Report. These statistics, however, have been found to be far from satisfactory. The very narrow scope of the investigation is shown by Table II.

TABLE II.

Table compiled from the Aldrich Report, giving number of male employees in each industry in July of 1860, 1870, 1880, and 1890.

Industry.	1860.	1870.	1880.	1890.
1. Agricultural Implements	8	40	43	51
2. Ale, Beer, and Porter	41	36	79	55
3. Books and Newspapers	48	84	171	153
4. Building Trades	392	727	747	842
5. Carriages and Wagons	14	24	40	40
6. City Public Works	2,464	1,641	559	716
7. Cotton Goods	480	540	535	592
8. Dry Goods	0	5	6	9
9. Ginghams	219	312	535	627
10. Groceries	3	5	6	6
11. Illuminating Gas	475	507	385	503
12. Leather	46	88	112	83
13. Lumber	14	22	9	8
14. Metals and Metallic Goods	851	1,207	1,643	1,813
15. Paper	27	15	16	13
16. Railroads	126	305	321	516
17. Sidewalks	38	21	16	17
18. Spice	7	7	18	26
19. Stone	443	641	697	690
20. White Lead	22	20	22	18
21. Woollen Goods	149	237	339	433
Total	5,867	6,484	6,299	7,201

Altho the data of the Aldrich Report are insufficient and results drawn from them are not even to be taken as showing the conditions in the States or industries covered, yet they may be used to further *illustrate* the methods of measuring variability. The result of tabulating the male wage-earners according to weekly wages in

[1] Ibid. "What answer, based upon actual data, can the economist give to these questions: Does skilled labor hold its own in the shifting proportions of grades of labor in the various industries? Are the chances of promotion within an industry increasing or decreasing? Is the status of the laborer confined within more narrow or less narrow limits?"

groups, each one dollar wide, is given in Table III. The arithmetic average and coefficent of variability for each year are given in Table IV. For the group of wage-earners considered, both the average wage and the variability have increased. However, as noted above, no sure conclusion can be drawn as to the distribution of wages even in the industries considered. In 1860 42 per cent. of the total number of employees came under the caption

TABLE III.

Table compiled from the Aldrich Report, giving the number and per cent. of wage-earners receiving the indicated weekly wage in July of 1860, 1870, 1880, and 1890.

Rate per Week.	1860.		1870.		1880.		1890.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Less than $2	84	1.43	—	—	4	.06	—	—
$2 and less than $3	57	.97	3	.05	76	1.21	18	.25
3 " " " 4	97	1.65	109	1.68	115	1.82	120	1.67
4 " " " 5	142	2.42	73	1.13	109	1.73	98	1.36
5 " " " 6	342	5.83	29	.45	45	.71	57	.79
6 " " " 7	2,663	45.40	115	1.77	319	5.06	215	2.95
7 " " " 8	523	8.91	193	2.98	1,235	19.60	592	8.23
8 " " " 9	317	5.40	99	1.53	313	4.97	597	8.30
9 " " " 10	433	7.37	453	6.98	699	11.09	994	13.85
10 " " " 11	249	4.25	665	10.28	697	11.07	729	10.12
11 " " " 12	73	1.24	67	1.03	135	2.14	150	2.08
12 " " " 13	756	12.89	631	9.73	700	11.10	758	10.53
13 " " " 14	66	1.13	1,466	22.60	633	10.04	857	11.90
14 " " " 15	4	.07	104	1.57	117	1.86	254	3.53
15 " " " 16	27	.41	613	9.45	386	6.14	484	6.72
16 " " " 17	1	.02	452	6.98	207	3.29	305	4.24
17 " " " 18	—	—	26	.40	30	.42	29	.40
18 " " " 19	18	.31	414	6.38	291	4.62	223	3.10
19 " " " 20	12	.20	40	.62	18	.29	108	1.50
20 " " " 21	1	.02	43	.66	15	.24	39	.54
21 " " " 22	—	—	328	5.06	27	.44	284	3.95
22 " " " 23	—	—	31	.48	12	.19	58	.81
23 " " " 24	1	.02	87	1.34	72	1.14	116	1.61
24 " " " 25	—	—	136	2.10	25	.40	77	1.07
25 " " " 26	—	—	253	3.90	4	.06	6	.08
26 " " " 27	—	—	—	—	—	—	1	.01
27 " " " 28	—	—	9	.14	6	.10	5	.07
28 " " " 29	—	—	2	.03	—	—	4	.06
30? " " " 31	—	—	38	.59	5	.08	16	.22
31? " " " 32	—	—	—	—	—	—	2	.03
32 " " " 33	—	—	—	—	1	.02	—	—
33 " " " 34	—	—	1	.02	—	—	—	—
35 " " " 36	—	—	1	.02	—	—	1	.01
38 " " " 39	1	.02	2	.03	2	.03	2	.03
47 " " " 48	—	—	—	—	—	—	1	.01
95 " " " 96	—	—	1	.02	1	.02	—	—
143 " " " 144	—	—	—	—	—	—	1	.01
Total	5,867	99.96	6,484	100.00	6,299	99.87	7,201	99.93

"City Public Works," while in 1890 only 10 per cent. were so classified. If such employees be omitted in 1860, the arithmetic average wage becomes $7.99, and the coefficient of variability becomes 37.9. The fact that no sure conclusion can be drawn as to the variability of wages from the statistics does not disprove the adequacy of the method. The tabulation necessary to apply the method shows the inadequacy of the statistics.

TABLE IV.

Arithmetic average and coefficient of variation of wages compiled from the Aldrich Report for years 1860, 1870, 1880, and 1890.

	1860.	1870.	1880.	1890.
Arithmetic average	$7.84	$14.37[1]	$11.05	$12.37
Coefficient of variability	34.7	35.8	39.3	39.9

[1] Greenback standard.

Both the coefficient of variability and α of Pareto's equation have been computed for various groupings of Prussian incomes for the years 1892 and 1902. The figures are given in Table V. The same conclusion as to

TABLE V.—PRUSSIAN INCOMES.

	α of Pareto's Equation.		Coefficient of Variability.	
	1892.	1902.	1892.	1902.
All incomes	—	—	564	675
Of 900 m. or more	1.656	1.570	443	542
Of 3,000 m. or more	1.668	1.560	316	383
Of 100,000 m. or more	1.945	1.702	128	144
Of less than 100,000 m. and more than 900 m.	1.538	1.549	—	—

concentration is indicated in each case by each method of measurement; namely, greater concentration in 1902.

It is to be noticed that the coefficient of variability decreases as the range of incomes is made less. On the

other hand, α of Pareto's equation does not necessarily decrease. It is not legitimate to compare the concentration of different ranges of income by means of the coefficient of variability, but it is legitimate to compare αs for different ranges, if α be considered a good measure of variability. By the very process of computing α, the law of distribution over the entire range is assumed.

VI.

The best available statistical tables in regard to the distribution of wealth in the United States, England, Germany, and France, have been brought together by Dr. Watkins in the article on the Statistical Evidence of Concentration of Wealth, already referred to.[1] It is not the object here to make a critical study of the statistics there given to determine their merits as being representative of the actual conditions in the various countries, but to take the statistics as being the best material available and to determine whether or not they show a tendency towards or away from greater variability. The question at hand is, "Given the statistics, what do they indicate?"

Dr. Watkins has compared the French statistics given in Table VIII. and the United Kingdom statistics shown in Table IX. The logarithmic curves for the United Kingdom estates of £100 and upwards and for the French successions of 2,000 francs and upwards are given in Chart II.

Upon examination of the curves Dr. Watkins concludes, "The figures for 1903 and 1904 subjoined indicate considerably less present concentration of riches in France than in the United Kingdom."[2] . . . The coefficient of

[1] Publications American Statistical Association, No. 81.

[2] Ibid., p. 47. Dr. Watkins says in a foot-note that "the difference is great enough to warrant an inference, even though the statistics are not exactly comparable." . . .

variability for the United Kingdom estates over £100 is 635, while the coefficient of variability for the French successions over 10,000 francs is 709, for successions over 2,000 francs is 1,080, and for all successions is 1,620. Therefore, the conclusions from the comparison of the coefficients of variability is at variance to the conclusion from a comparison of the slopes of the logarithmic curves. Which is correct?

In order to get a third measure of concentration to compare with the two leading to opposite conclusions, the writer has adopted a slight variation of the test of Professor Lorenz. Charts VII. and VIII. show the upper right-hand corner and the lower left-hand corner of the rectangle of accumulated percentages of estates and wealth

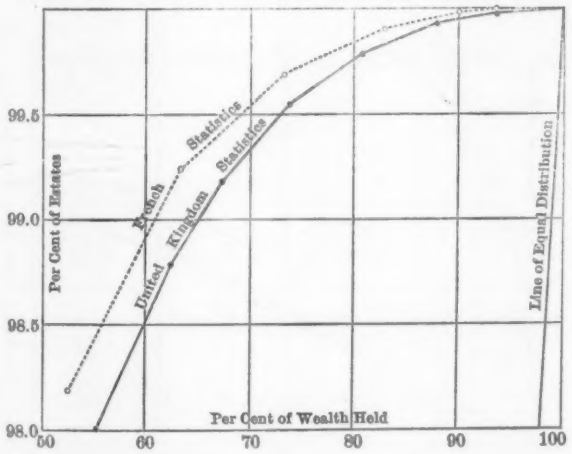


CHART VII.—APPLICATION OF METHOD OF LORENZ TO BRITISH ESTATES OF £100 OR MORE IN 1901-02 TO 1905-06 AND FRENCH ESTATES OF 2,000 FRANCS OR MORE IN 1903-04. (UPPER RIGHT-HAND PORTION OF RECTANGLE OF ACCUMULATED PERCENTAGES.)

held according to the French successions of 2,000 francs and upwards and the United Kingdom estates of £100 and upwards. Table VI. gives the percentages. The vertical and horizontal scales have been chosen so that the extremities of the graphs could be compared. The greater bulge of the French graph indicates greater concentration among the French successions than among

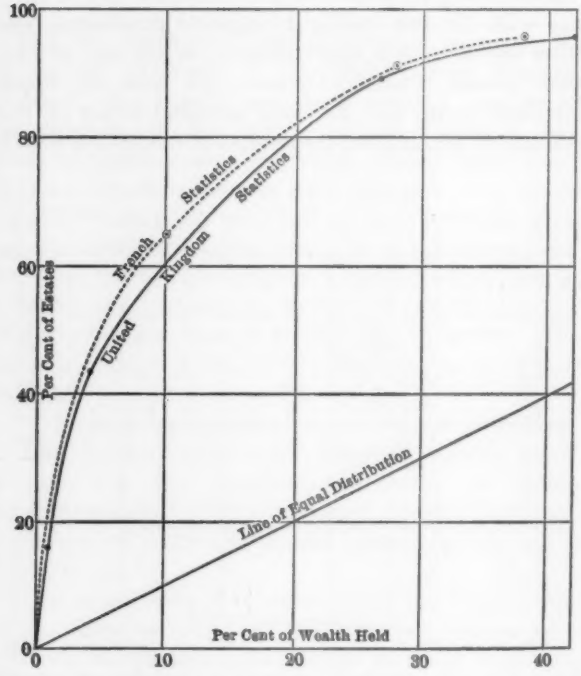


CHART VIII.—APPLICATION OF METHOD OF LORENZ TO SAME STATISTICS AS WERE USED IN CHART VII. (LOWER LEFT-HAND PORTION OF RECTANGLE OF ACCUMULATED PERCENTAGES.)

United Kingdom estates. This test leads one to the same conclusion as the comparison of the coefficients of variability. It is safe to conclude, therefore, that the comparison of the slopes of the logarithmic curves is not a reliable test of concentration.

The coefficients of variability for the statistics given in Tables VIII. to XII. have been computed as follows:—

(1) The number of estates and average amount of estates in each class were determined.

(2) The true arithmetic average size of all of the estates for each period was computed.

(3) Deviations of the class average from the general average were found, and the squares multiplied by the number of estates in each class.

(4) From the data thus obtained the coefficients of variability were found by inserting in the formula as given on page 430.

A summary of the coefficients of variability is given in Table VII.

TABLE VI.

United Kingdom, 1901–02 to 1905–06.		France, 1903 to 1904.	
Percentage of Estates Richest to Poorest. (Over £100.)	Percentage of Wealth held by Such Estates.	Percentage of Estates [1] Richest to Poorest. (Over 2,000 francs.)	Percentage of Wealth [2] held by Such Estates.
%	%	%	%
.0157	6.38	.00692	6.28
.0713	12.22	.02263	9.96
.2095	19.24	.09873	17.19
.4494	26.18	.30773	26.75
.8142	32.73	.75673	36.79
1.2077	37.63	1.72273	47.71
1.9957	44.86		
4.6	58.1	4.6	61.8
10.9	73.4	8.9	71.7
56.4	95.9	35.3	89.9
84.0	99.0		

[1] Number of estates, 318,154.

[2] Total amount, 9,868,784 thousand francs.

TABLE VII.

COEFFICIENTS OF VARIABILITY.

1. *Massachusetts Probates.*

	1829–31.	1859–61.	1879–81.	1889–91.
All Estates	510	445	527	426
Estates of $5,000 or over	242	241	311	252

2. *United Kingdom Estates Liable to Estate Duty.*

	1838.	1884–85. to 1888–09.	1901–02 to 1905–06.
Estates of £100 or over	—	—	635
Estates of £1,000 or over	293	360	485
Estates of £10,000 or over	—	—	270

3. *French Successions.*

	1903–04.
All Successions	1,620
Successions over 2,000 francs	1,080
Successions over 10,000 francs	709
Successions over 250,000 francs	279

TABLE VIII.

SUCCESSIONS IN FRANCE ACCORDING TO NET VALUE, 1903 AND 1904: CLASS, AVERAGE AMOUNT, AND NUMBER.[1]

Class.	Average Amount.	Number.
	(Francs.)	
From 1 to 500	263	241,097
" 501 to 2,000	1,280	208,382
" 2,001 to 10,000	4,880	205,957
" 10,001 to 50,000	21,300	83,889
" 50,001 to 100,000	69,900	13,955
" 100,001 to 250,000	156,000	8,872
" 250,001 to 500,000	351,000	3,073
" 500,001 to 1,000,000	693,000	1,430
" 1,000,001 to 2,000,000	1,421,000	664
" 2,000,001 to 5 mil.	2,950,000	242
" 5 to 10 mil.	7,260,000	50
" 10 to 50 mil.	17,700,000	18
Upwards of 50 mil.	75,300,000	4
Total	—	767,633
Average succession	13,284	—

[1] Computed from table given in Watkins's "Statistical Evidence of the Concentration of Wealth," p. 48.

TABLE IX.

CLASS, AVERAGE AMOUNT, AND NUMBER OF ESTATES OR PORTIONS OF ESTATES LIABLE TO ESTATE DUTY IN THE UNITED KINGDOM FOR THE FIVE-YEAR PERIOD 1901–02 TO 1905–06.[1]

Class.	Average Amount.	Number.
£100 and less than £500	£458	28,551
500 " " " 1,000	837	49,136
1,000 " " " 10,000	3,680	81,140
10,000 " " " 25,000	18,200	11,221
25,000 " " " 50,000	38,900	4,500
50,000 " " " 75,000	68,300	1,403
75,000 " " " 100,000	93,000	699
100,000 " " " 150,000	132,000	649
150,000 " " " 250,000	216,000	427
250,000 " " " 500,000	378,000	246
500,000 " " " 1,000,000	783,000	99
1,000,000 and upwards	3,022,000	28
Total	—	178,099
Average	£7,440	—

[1] United Kingdom Statistical Abstract, 53d number, p. 45.

TABLE X.

PROBATES IN MASSACHUSETTS: CLASS, AVERAGE AMOUNT, AND NUMBER.[1]

Class.	1829–31.		1859–61.		1879–81.		1889–91.	
	Average Amount.	Number.	Average Amount.	Number.	Average Amount.	Number.	Average Amount.	Number.
Under $500	$185	1,431	$234	1,485	$245	1,822	$247	2,217
$500 to 1,000	733	463	726	960	722	1,451	731	1,738
1,000 to 5,000	2,370	1,274	2,400	2,827	2,460	4,588	2,430	6,197
5,000 to 10,000	6,790	295	6,910	797	6,980	1,421	6,980	1,969
10,000 to 25,000	15,470	157	15,360	507	15,420	1,023	15,440	1,498
25,000 to 50,000	35,200	42	34,900	168	34,000	410	34,600	480
50,000 to 100,000	73,200	25	69,500	92	70,500	218	69,800	265
100,000 to 200,000	134,200	6	129,000	52	139,700	111	136,700	134
200,000 to 300,000	—	0	237,500	18	240,000	37	249,000	45
300,000 to 400,000	320,000	2	341,000	7	346,500	22	339,000	22
400,000 to 500,000	415,400	1	474,500	3	438,300	10	453,000	13
500,000 and over	634,000	2	848,000	6	1,145,000	29	795,000	30
Total	—	3,698	—	6,922	—	11,142	—	14,608
Average probate.	$3,920	—	$7,690	—	$12,330	—	$10,650	—

[1] Computed from tables given in an article on Statistical Evidence of the Concentration of Wealth, by G. P. Watkins, Quarterly Publications of the American Statistical Association, No. 81, pp. 30–31.

TABLE XI.

CLASS, AVERAGE AMOUNT, AND NUMBER OF ESTATES OVER £1,000 EACH SUBJECT TO PROBATE DUTY IN THE UNITED KINGDOM IN 1838, 1884–85 TO 1888–89 AND 1901–02 TO 1905–06.[1]

Class.	(1) 1838.		(2) 1884–85 to 1888–89.		(3) 1901–02 to 1905–06.	
	Average Amount.	Number.	Average Amount.	Number.	Average Amount.	Number.
£1,000 to £10,000	£3,040	6,006	£3,200	55,767	£3,680	81,140
10,000 to 50,000	19,380	901	21,150	10,145	24,100	15,721
50,000 to 100,000	68,400	83	70,000	1,251	76,500	2,102
100,000 to 500,000	163,200	35	188,500	737	205,000	1,322
500,000 to 1,000,000	600,000	2	654,000	43	782,000	99
1,000,000 and over	1,000,000	1	1,734,000	12	3,022,000	28
Total	—	7,028	—	67,955	—	100,412
Average	£7,026	—	£9,834	—	£12,663	

[1] Computed from tables given in Watkins's "Statistical Evidence of the Concentration of Wealth," pp. 40–41.

(1) Amount of personal property subject to probate and administration duties in the United Kingdom, 1838.
(2) Estates assessed to probate duty in the United Kingdom during the five-year period 1884–85 to 1888–89 (exclusive of property assessed to corporation duty).
(3) Estates or portions of estates liable to estate duty in the United Kingdom for the five-year period 1901–02 to 1905–06.

TABLE XII.

CLASS, AVERAGE AMOUNT, AND NUMBER OF INCOMES IN PRUSSIA IN 1892 AND 1902.[1]

Class.	1892.		1902.	
	Average Amount.	Number.	Average Amount.	Number.
(Marks.)				
Under 900	458	8,726,215	465	9,053,608
900 to 3,000	1,372	2,118,969	1,350	3,309,696
3,000 " 6,000	4,070	204,544	4,050	291,341
6,000 " 9,500	7,440	55,561	7,410	77,636
9,500 " 30,500	15,500	46,092	15,450	64,737
30,500 " 100,000	49,900	9,034	49,600	13,205
100,000 " 500,000	178,000	1,555	187,000	2,594
500,000 " 1,000,000	653,000	72	666,000	108
1,000,000 to 2,000,000	1,370,000	27	1,455,000	44
Over 2,000,000	5,000,000	4	4,310,000	16
Total	—	11,162,073	—	12,812,985
Average income	870	—	997	—

[1] Computed from table given in Watkins's "Statistical Evidence of the Concentration of Wealth," p. 52.

The following conclusions may be drawn from a study of the coefficients of variability:—

(1) Probates in Massachusetts showed the greatest concentration in 1879–81 and the least concentration in 1889–91.

(2) The concentration among dutiable estates in the United Kingdom has been increasing during the period from 1838 to 1906.

(3) The indications are that there is less concentration in Massachusetts than in the United Kingdom. (Compare the variability among Massachusetts probates of $5,000 and over with that of United Kingdom estates of £1,000 and over.)

(4) The indications are that there is greater concentration among French than among United Kingdom estates.

(5) The tendency among Prussian incomes is toward greater concentration.

(6) Average estates and average incomes have increased in every case examined. The increase in that average is due to a disproportionate increase of the larger estates, except in the case of Massachusetts.

Any thorough examination of the available statistics concerning wealth distribution forces upon one an appreciation of the inadequacy of the statistical data and especially of the inadequacy of statistics for the United States.

VII.

The method that has been used by the writer in considering the various measures of the inequality in the distribution of wealth is entirely empirical. Professor H. L. Moore has recently pointed out with approval the purely utilitarian or pragmatic character of the argument of

statisticians.[1] He quotes from Jevons's *Theory of Political Economy* as follows: "The deductive science of economics must be verified and rendered useful by the purely *empirical* science of statistics."[2] No excuse, therefore, is offered, or need be offered, for the use of empiricism.

In conclusion, the various methods developed may be considered briefly. All of the methods meet the test of relativity. A uniform percentage change in the amount of wealth held by each individual will not affect the measure of inequality. Lorenz's method certainly does measure concentration, but has the defects, first, of making comparison at the extremities of the curves extremely difficult, if not impossible, and, second, of not providing a numerical measure of concentration. Pareto's method provides us with a numerical measure which seems to be a good measure in some cases, but analysis has shown that the accuracy with which the law describes the distribution of wealth is merely apparent, and not actual. Watkins's method allows too much of the subjective to enter. The measurement by the eye of relative average curvatures is not satisfactory.

The coefficient of variability is recommended as the most satisfactory measure of variability because:—

1. All of the statistics of the frequency table enter into the determination of this *numerical* measure.

2. The larger and the smaller estates are automatically weighted by the use of the squares of the deviations. No other more satisfactory method of weighting has been suggested.

3. The deviations are taken from the arithmetic average, which is perfectly definite and easy to compute. In the writer's mind the arithmetic average best repre-

[1] "Statistical Complement of Pure Economics," Quarterly Journal of Economics, November, 1908, p. 16 *et seq.*

[2] Ibid., p. 5. The Italics are mine.

sents the "plane of distribution." If the median were used, some theory of distribution would have to be assumed in order to estimate it from the frequency table.

4. It is not difficult of computation. With the help of computing devices, such as the slide rule and tables of squares, the work is by no means excessive.

Objection may be offered to the coefficient of variability because tolerably complete statistics are necessary in order that it may be used. Answer is to be given that only when we do have complete statistics is *any* comparison of variability to be depended upon.

WARREN M. PERSONS.

DARTMOUTH COLLEGE.

NOTE TO p. 423.

The medians and quartiles, and Bowley's quartile measure of dispersion for Prussian incomes of M. 900 or over, computed for the equations

$$1.656 \log x - 11.3395 + \log N = 0 \quad (1892)$$
$$1.570 \log x - 11.1767 + \log N = 0 \quad (1902)$$

are given in the following table:—

	1892.	1902.
Median	M. 1488.	M. 1327.
Q_1	1165.	1025.
Q_3	2262.	2063.
$\frac{Q_3 - Q_1}{Q_3 + Q_1}$	32.0%	33.6%

THE SLIDING SCALE OF WAGES IN THE COTTON INDUSTRY.

SUMMARY.

Labor disputes formerly bitter in Fall River, 450.—The mule-spinners' union, 451.—The strike of 1904 and the first sliding scale, 455.—Dissatisfaction of employees, 456.—The new sliding scale of 1907, 459.—Higher wages in 1907–08, 461.—Lower wages in 1908, 464.—Acceptance of reduction by the labor unions, 465.—Further slight revision in 1908, 468.

BECAUSE Fall River is the largest center of the cotton industry in America, that city has long held an unenviable reputation for strikes and every other form of industrial unrest. Wage controversies affecting the entire industry have been adjusted here, and many times local manufacturers and operatives have been deprived of dividends and wages while the same classes in other communities in this respect more favored went quietly about their business, awaiting the issue. But at last both manufacturers and operatives have determined to change this situation, if possible, and at the end of the last general strike, which occurred in 1904, a plan for a sliding scale of wages was adopted. This plan has already resulted in better industrial relations between employer and employee, and both are hopeful that this agreement or some modification of it will furnish a basis for permanent industrial peace. Before describing the present wage system, a few words are necessary concerning the previous attitude of employer and employee in Fall River.

When in the first quarter of the last century a beginning was made in the manufacture of cotton goods, the factories were operated by native help. But, with the

growth of the industry, foreigners came to operate the spindles, and the first of these were English workers from Lancastershire. So long as employer and employee were of the same birth and in most respects social equals, industrial disturbances were rare. But with the coming of the English operatives a new element was introduced, for these men were agitators by tradition. Following the lead of those early trade unionists who fought so nobly for the cause of human freedom in the days when the factory system in Lancastershire had reduced the British work-people nearly to a condition of servitude, they introduced methods of agitation in a community where the same need for these methods did not exist. Of course there was a work for unionism to accomplish even in this community, for the growth of the factory system was already showing its tendency to minimize the personality of the worker, as it had actually annihilated his individuality in England. But the vigorous methods employed in the old world to effect his self-preservation were in America directed towards obtaining for labor what seemed, to the employers at least, a disproportionate share of the product of industry.

The first union formed in Fall River was that of the mule spinners in 1858. Because the members of this craft were all men whose wives and children were afterwards organized into other unions, the spinners obtained a position of great power,—a power which was immediately felt by the mill owners. With the rise of the spinners' union, the manufacturers met force with force and, no doubt, injustice with injustice. In those days the most powerful individual in the industrial community was the secretary of the spinners' union, and at his word a strike was declared or called off. This was possible, not only because of the influence which the spinners, as heads of families, were able to exert on the action of other unions,

but because it was quite impossible to operate any department of the factory when the mule spinners were on strike. Thus it frequently happened that a demand made by this union in the interest of its own members, and in the benefits of which the others did not share, threw the whole body of workers out of employment. The injustice of having a comparatively few workers thus dominate the labor situation gradually became apparent, not only to the manufacturers, but to the members of other crafts, who so often suffered on account of the selfishness of the stronger body.

The spinners became the highest paid of all the operatives, receiving, when the business was prosperous, more in weekly wages than we are accustomed to pay bookkeepers even in these later times; and all the operatives contributed to this result. While the spinners' was by far the most important union, the other organizations flourished, and all presented a solid front of resistance to the manufacturers. Following this development of unionism came a period of almost incessant strikes, the most important of which occurred in the year 1879. Altho the event happened in my boyhood, I remember vividly a parade of operatives which formed the spectacular feature of this strike. At the head of a great procession, a coal-hod for his helmet, rode the editor of the *Labor Standard*, a man of fiery temper in those days, but now the editor of a magazine which has done much to educate the worker to a better understanding of economic truths and the author of books which have made for a better social understanding between the classes.[1] That was a day of wild disorder in our busy city. Mill agents were hanged in effigy, their homes were stoned and their families forbidden to go into the streets, while the mayor read the riot act in front of the City Hall and bravely faced a

[1] The reader will recognize the description of Mr. George Gunton.

volley not of bullets, but of loaves of bread. That day marked, perhaps, the point of greatest separation between the employer and employee in Fall River. Yet even at this time the plan for a sliding scale was discussed by both mill owners and operatives. The consensus of opinion among the manufacturers was that the sliding scale would slide up without difficulty, but that it would never slide down. Reviewing the history of the labor situation in that community, I believe that the manufacturers were then right in their judgment, for at this period employers and employees were separated into hostile camps and the time was not ripe for the gospel of a common welfare.

Like all reformations, the change in temper on the part of both manufacturer and operative was a slow process. The dawn of a better day began with the downfall of the spinners' union. That organization came to the height of its power under the leadership of a somewhat remarkable man. You will find among the citizens of Fall River very many and very diverse opinions concerning the character of this labor leader, but on one point there is no room for dispute,—he had the ability to command the unquestioning obedience of his union. Under his leadership the spinners' union followed an aggressive policy which resulted in the bitter resentment of many workers and of all the manufacturers. It was the latter, however, who, in the end, found the means of overthrowing his power.

The spinning frame which could be operated by women was perfected to a point where it was possible to use the yarn produced in the place of mule-spun yarn, and, while the quality was not quite the same, it was sufficiently near the standard to enable manufacturers to throw out the mules, which they did at a great expense. The expense, however, they regarded as a small

price in return for the advantage accruing to them in the utter defeat of the spinners. The death of the leader before the defeat of his union was complete left the labor position in its militant aspect decidedly weakened.

There was no other union possessing the characteristics which gave the mule spinners their dominant position, and no other individual labor leader who for the time was able to cope with the situation. Hence there followed a cessation from industrial warfare. When I speak of the downfall of the spinners' union, I do not mean to imply that it ceased to exist, but merely that it lost rank as the most powerful of all the unions and became the least of the labor organizations. It should be explained, also, that the various crafts—the carders, the weavers, the slasher tenders, the spinners, the loom fixers—have each their separate unions, the secretaries of which now form the Textile Council, a body without legislative power, but which advises in matters affecting all the unions. Thus to-day no one union dominates the labor situation, as all have an equal representation in the Textile Council, with which the manufacturers now deal instead of with a single organization, and to which, for various reasons, the others have been subordinated. From the point of view of the individual worker, this fact marks a distinct advance in the methods of union organization.

Without following in detail the history of the relations of the manufacturers and operatives down to the time of the great strike in 1904, it may be said that from the fall of the spinners' union until to-day there has been a gradual growth of friendly personal relations between the labor leaders and the representatives of the manufacturers' association, brought about by frequent conferences to consider industrial conditions. These conferences, which have done so much to improve conditions in Fall River,

were first requested by the labor leaders, and for a long period were refused by the manufacturers. In the old days, when industrial warfare was so keen, it was felt by many manufacturers that to grant such conferences was to give the unions an undue recognition, and before the experiment was tried it was confidently predicted that no benefit could ever come to either party by this method. Yet the custom grew up, and the predictions of the pessimists were not fulfilled.

The great strike of 1904 was to resist a cut-down of 12½ per cent. in wages, made imperative by market conditions. From the beginning the defeat of the unions was inevitable, and this fact was recognized by the labor leaders, who used their best endeavors to prevent the strike, and only consented to it when their opposition to the majority of the active unionists endangered their prestige with the body of workers. The fight was a long and bitter one, and ended in a compromise, which was in effect a victory for the manufacturers, except that it also adopted the plan for a sliding scale of wages. The strike was settled in a conference between the labor leaders and representatives of the manufacturers' association, at which Mr. Douglas, the Governor of the State, himself a large employer of labor, presided.

There was nothing new in the plan then adopted except that it was the first successful attempt, in this country, to apply the principle of the sliding scale to the cotton industry. The sliding scale of wages takes into consideration, first of all, the fact that prosperity or the lack of it, among manufacturers and operatives alike, depends in a large measure upon the market conditions which determine the prices of the raw material and the finished fabric,—conditions which neither employer nor employee can control. It admits the fact that there are times when market conditions make it imperative that wages

should be reduced and times when market conditions warrant an increase of wages; and it provides a plan by which such advance and decrease in wages may be made in an orderly and prearranged manner.

The sliding scale agreement went into effect in Fall River on October 21, 1905, and provided for an immediate increase in wages of 4 per cent., bringing the price of weaving to 18 cents per cut, which was established as a minimum wage. The sliding scale was to be based upon the margin between the market price of 8 pounds middling uplands cotton and 45 yards (which was fixed as a standard cut) of 28-inch 64 × 64 print cloth, and 33.11 yards of 38½-inch 64 × 64 prints,—the amounts of cloth which can be produced from this quantity of cotton. A premium of 1 per cent. was to be added to the wages for every cent the margin exceeded 72½ cents up to and including 85 cents. For every cent the margin should exceed 85 cents the premium was to be increased ½ of 1 per cent. The first period of this experiment extended from October, 1905, to June, 1906, and in the thirty-one weeks included in this period the average premium added to the wages was 3.84 per cent. This result proved unsatisfactory to the operatives, who then asked for a restoration of the wage scale in force previous to the strike. This was practically a demand for an advance of 10 per cent. over the minimum established by the conference. A demand was also made to abandon the sliding scale plan, which from the beginning had been unsatisfactory to the operatives; for the scale—then figured weekly—introduced an element of uncertainty in the rate of wages which the workers could not understand. How frequent and wide these fluctuations were is illustrated in Table I :

TABLE I.

Week ending	*Margin.*	*Wage Premium (per Cent.) above 18 Cents per Cut.*
1905. October 27	.77	5
November 3	.757	3
" 10	.714	0
" 17	.74	2
" 24	.735	1
December 1	.752	3
" 8	.724	0
" 15	.7502	3
" 22	.7376	1
" 29	.7537	3
1906. January 5	.7641	4
" 12	.7809	6
" 19	.7523	3
" 26	.7556	3
February 2	.7949	7
" 9	.8116	9
" 16	.8145	9
" 23	.8275	10
March 3	.8285	10
" 10	.8019	8
" 17	.8127	9
" 24	.7782	5
" 31	.7542	3
April 7	.76152	4
" 14	.75016	3
" 21	.74819	2
" 28	.75552	3
May 5	.7285	0
" 12	.714	0
" 19	.7068	0
" 26	.7114	0

Average premium for 31 weeks . . . . 3.84 per cent.

It was difficult for the operatives to understand why they were paid 19.80 cents for each cut of cloth woven in the week ending March 3 and only 18 cents per cut in the week ending May 5, only two months afterwards. They did understand that the reduction was equal to a 10 per cent. cut-down, and that the margin, and conse-

quently their wages, remained unaltered at this figure for the next four weeks. They reasoned that, if it were possible to pay the higher wages in March, it was possible to pay these wages in May also, because it is customary to buy cotton in advance of immediate needs and to sell goods considerably in advance of their production; and they demanded that the higher rate be received regularly from week to week, and refused longer to submit to the sliding scale, which they declared to be unsatisfactory.

Now the reduction from 19.80 cents per cut to 18 cents was due to an increase in the New York quotation of middling uplands cotton from 11 to 12 cents per pound, and to a reduction in the quoted price of print cloth from 5 3-16 to 5¼ cents per yard. These figures were quite beyond the understanding of the mass of operatives. Those few who did understand the working of the scale contended that an advance in the price of cotton did not mean an increase in the cost of manufacturing unless the agents actually bought cotton at the higher price, and that a reduction in the price of cloth by 1-16 of a cent per yard did not mean smaller profits, unless goods were actually sold at the lower price. The mills had been stocked with cotton, so that it was unnecessary to buy at the higher quotation. A large part of the goods produced by the mills consisted of fabrics other than print cloth, the prices of which were in no way regulated by the price of prints; and, even if they were, the goods had been sold ahead at the higher price. In a word, the operatives contended that under the sliding scale their wages were arbitrarily changed from week to week to conform to market fluctuations that did not affect the profits of their employers and had no connection with their own wages. The cause of the failure of the first sliding scale agreement was the fact that by its terms

wages were adjusted weekly. During the first twenty-seven weeks, only three times were wages uniform in any two consecutive weeks, and the wages premium varied from 0 to 10 per cent. This fact kept the operatives in a constant state of uncertainty, which could lead to no other end than extreme dissatisfaction.

Another conference was held in which the manufacturers undertook to make the plan clear to the operatives, but the latter were determined to do away with the sliding scale, and, while conditions did not fully warrant the advance, the mills could be run at a profit under the wage scale demanded, and to prevent another strike, which their refusal would have certainly entailed, the manufacturers granted the demand. This action restored wages to the scale in force previous to the great strike, and took place in July, 1906. In November of the same year, when a period of prosperity greater than ever before known in the cotton industry was well under way, and the operatives began to see that, except for their short-sighted action in demanding a fixed increase, they would have been receiving, under the provisions of the sliding scale agreement, a largely increased wage, the demand was made for another 10 per cent. advance. This, too, was promptly granted. The period of prosperity continued. Again it appeared that, had the sliding scale been retained, wages would have advanced still higher, and in May, 1907, a demand was made for still another increase of 10 per cent. This demand the manufacturers stubbornly resisted, and for a time another strike seemed inevitable. Finally, an agreement was reached in conference, by which the increase was granted and at the same time a sliding scale for automatically regulating wages was again adopted. This agreement brought wages to the highest point ever known in Fall River,—an increase of 30 per cent. over the minimum

established when the great strike was settled. The new plan contained several modifications of the former scale. All of them were designed to make its operations less confusing to the mass of the workers.

The most important change in the new agreement was that the rate of wages should be revised but twice each year and should remain unchanged for a period of six months, being based upon the average margin for the previous six months. This feature removed the objection which caused the failure of the earlier agreement, under which wages were subject to weekly fluctuations. While for the whole period of six months the net results under the old and the new plan would be approximately the same, the new scale guaranteed a fixed rate from week to week, thus overcoming the uncertainty which had formerly prevailed among the help as to just the amount each might expect to find when he opened his pay envelope. This plan, moreover, made the relations between the fluctuations of the cotton market and the rate of wages clearer to the uninformed operatives, and by covering a period of six months answered their arguments in relation to buying cotton and selling goods in advance of the actual market.

Under the old scale an increase of 1 per cent. above 18 cents per cut had been given for every cent of the margin above 72½ cents until a margin of 85 cents was reached. Beyond this the increase had been ½ per cent. for each cent of the margin. The new scale provided arbitrary increases of rates for certain margins within specified limits; and these rates were somewhat larger than those provided for in the old list. The new scale, like the old one, provided for a minimum of 18 cents per cut and also for a maximum of 23.96 cents. The previous scale provided for no maximum. In both scales it was provided that the rate of wages in all departments

other than weaving should be adjusted on the same basis. While there is no standard price of wages fixed by agreement in the departments other than weaving, competition among the different mills has practically established a minimum upon which wages are adjusted in harmony with the sliding scale for weaving. The marginal limits arbitrarily fixed by the new scale were separated by five points, and Table II. illustrates the variation of wages within these limits, figured on the old and the new basis:

TABLE II.

Margin.	*New Wage Basis.*	*By Old Scale.*
115 points.	23.96 cents.	22.95 cents.
110 "	23.42 "	22.50 "
105 "	22.87 "	22.05 "
95 "	21.78 "	21.15 "
85 "	20.69 "	20.25 "
80 "	19.66 "	19.35 "
75 "	18.68 "	18.45 "
72½ "	18 "	18 "

This new scale went into effect under the maximum of 23.96 cents, which was the highest rate ever paid for weaving. In order to show clearly the relation of the sliding scale plan to the average wages during a period of years, Table III. is added, showing the fluctuations in wages in Fall River from 1884 to 1907, inclusive:—

TABLE III.

	Per Cut.
February 4, 1884	18.50
January 19, 1885	16.50
March 1, 1886	18.15
February 13, 1888	19.00
July 11, 1892	19.60
December 5, 1892	21.00
September 11, 1893	18.00
August 30, 1894	16.00
April 22, 1895	18.00

TABLE III.—*Continued.*

	Per Cut.
January 1, 1898	16.00
February 27, 1899	18.00
December 11, 1899	19.80
March 17, 1902	21.78
November 23, 1903	19.80
July 25, 1904	17.32
October 30, 1905	[1]18.61
July 2, 1906	19.80
November 26, 1906	21.78
May 27, 1907	23.96

This scale, as I have said, went into effect in May, 1907. The agreement provided that wages were to be adjusted semi-annually. When in the following November the readjustment occurred, it was found that the average margin for the six months had been 16 points above the maximum, and consequently the maximum rate of 23.96 cents was fixed as the rate of wages to be paid until the following May. This ready settlement of the wage question pointed clearly to the advantages of an automatic agreement. A period of unparalleled prosperity was rapidly merging into one of trying uncertainty. The financial panic had commenced, and a wage controversy at this juncture would have been disastrous not only to the mills of Fall River, but to the cotton industry throughout the country. It was apparent to all, however, that the sliding scale now favored the operatives, as it fixed their wages for the following six months at the highest rate ever paid in the history of the industry and at a time when all indications pointed to a rapid decline of profits.

The events of the next six months, ending in May, 1908, illustrate best of all the chief benefit to be derived from a sliding scale of wages. The margin between the price of eight pounds of cotton and the selling price of

[1] Average under sliding scale.

the cloth that could be made from it, in the six months previous to November, 1907, when the adjustment took place, had averaged $1.31 and at that time stood at $1.303. From then it steadily fell until on January 28 it was only $0.899. By this time the operatives began to study the market quotations of cotton and cloth with the same eager interest as their employers; and never before in the history of the industry was there so strong a realization of the community of interests between mill owners and workers. The margin continued to fall, and yet the sullen preparations for resistance to an expected reduction of wages, which usually marked a sharply declining market, were entirely absent, but in its stead were heard, on all sides, earnest discussions concerning market conditions and their effect upon wages and profits. At the meetings of the labor unions the secretaries presented figures showing the highest, lowest, and average price of cotton during the period and traced the fluctuations of the margin.

By the 10th of April the margin had fallen to 61 cents or over ten points under the minimum. The mills for several weeks had been curtailing production, but, thanks to the sliding scale, which fixed the wages at the maximum, there was a noticeable absence of the suffering which usually attends such a curtailment.

When on May 25 the time again came for the semi-annual adjustment of wages, the margin had fallen as low as $0.52 or $0.22½ below the minimum; and it was found that for the period of six months the average had been $0.79, which called for a reduction in wages from 23.96 cents per cut to 19.66 per cut, amounting to a general reduction in wages of all the workers of 17.94 per cent.

Table IV. shows the gradual decrease of the margin during the six months we are considering:—

TABLE IV.

	Cotton.	28-inch. 46 x 64.	38½-inch. 64 x 64.	Margin.
1907.	*Cents.*	*Cents.*	*Cents.*	
November 29	11.39	5¼	5¼	1.250240
December 6	11.85⅛	5⅛	5⅜	1.181040
December 13	12.06⅜	4⅞	5⅛	.990104
December 20	11.88⅛	4⅛	5⅜	.919557
December 27	11.74	4⅛	5⅛	.927425
1908.				
January 3	11.64	4⅛	5⅛	.918700
January 10	11.38⅛	4⅛	5⅛	.914720
[1] January 17	11.825	4⅛	5⅛	.879390
January 24	12.05⅛	4⅛	5⅜	.866110
January 31	11.75⅛	4⅛	5⅛	.897980
February 7	11.70⅛	4⅛	5⅜	.884740
February 14	11.59	4	5⅛	.846100
February 21	11.40⅛	4	5⅛	.856470
February 28	11.42	3⅞	5⅛	.771480
March 6	11.56⅜	3⅞	5⅛	.738740
March 13	11.40	3⅞	4⅞	.714130
March 20	10.98⅛	3⅞	4⅞	.688298
March 27	10.46⅜	3⅞	4⅛	.676392
April 3	10.45	3⅞	4⅛	.619531
April 10	10.29⅛	3⅞	4⅛	.611505
April 17	10.025	3⅞	4⅛	.632837

These figures operatives and manufacturers alike studied week by week, and never before was the need for a reduction of wages so thoroughly understood by the workers, nor the truth brought home to them so completely that manufacturers, operatives, and consumers are very intimately related. My own belief is that this reduction of over 17 per cent. was the crisis in the success of the sliding scale. The fact that the reduction was accepted without hesitation gives promise for the continued success of the experiment. In any event it effectively disposes of the old cry of the pessimists that the sliding scale will always slide up, but never down.

The spirit in which the reduction was accepted by the operatives is best told in the words of James Tansey,

[1] Example showing how the margin is figured:—

8 x 11.825 cents equals	.94600	1.91250	1.738275	.966500
45 x 4¼ " "	1.91250	.94600	.946000	.792275
33.11 x 5¼ " "	1.738275	.96650	.792275	2)1.758775
				.8793875

the president of the Textile Council and secretary of the Carders' Association, in his report to the several unions. The following extract is somewhat long, but deserves careful attention as illustrating the growth of the idea in one industrial community, at least, that employer and employee have a common interest:—

We, the members of the Textile Council, regret that such conditions have arisen which should call for the reduction in wages as stated in the agreement; and while we realize that the reduction is a steep one, we hope and feel that you will not lose sight of the fact that it is being taken from the highest rate of wages that has ever prevailed during the life of the Textile Council and for many years previous to its existence. It is safe to say that we can go back at least thirty-five years and then only under the most exceptional conditions can a comparison be made.

It should not be necessary to remind you that the rate of wages paid during the last twelve months is 10 per cent. higher than ever was paid in the city during our life as combined unions, and further that it is 20 per cent. higher, with an exception of a period of about nine months a few years ago.

With regard to the present agreement, we do not nor have we ever taken and declared that it is the panacea for all difficulties existing between the employer and employee in our trade, but we do declare emphatically and without reserve that it is and has proven to be the best agreement for the operatives that was ever accepted by the employers for the control and regulation of the rise and fall in wages, and further assert, for reasons stated above, that it is well worthy of a trial of experience and as a guide in dealing with such questions in the future.

Until such time that we see that a change is necessary in the margin scale, we say to our members that this agreement should be honorably lived up to, as it was entered into honorably by vote of acceptance and endorsed by all of the unions at their general meetings before being signed by the representatives of the respective associations contracted.

Even though the reduction in wages is greater under the agreement than was anticipated by its most ardent supporters, and which we regret, we are not prepared to declare that it is a failure, because, owing to the unfortunate trade conditions previously re-

ferred to which suddenly and unexpectedly worked havoc with our industry, we do not believe it has had a fair trial; and until such time that it has, the least that can be expected is that judgment should be suspended and hasty action upon our part be rejected.

The only comparison that we can draw to compare with present conditions is that which existed in 1898, ten years ago, when the market got down about 50 cents, and we were obliged to accept reductions in wages which brought the weaver down to 16 cents per cut and all other departments in proportion. The margin to-day is but 57.61 cents and it has been between the fifties and sixties for nearly two months, and the price per cut under the reduced rate is 19.66 cents per cut, with operatives in all other departments in proportion, a matter of about 20 per cent., a higher rate than prevailed under similar conditions in 1898, to say nothing of other improved conditions.

Again repeating our regret for the reduction of wages that goes into effect Monday morning, brought about through conditions over which neither employer nor employee has control, we bring these matters to your attention, so that you can deliberate on the conditions and situation with more intelligence and give to it that fair, just and conservative consideration that all such important subjects of its kind are entitled.

The sliding scale plan now (1909) stands just as it has been described, except for some minor changes occasioned by an event which occurred two months after this readjustment. The sharp reduction in wages gave rise quite naturally to a deep disappointment to many operatives, and at a meeting of the Mule Spinners' Association, attended by only one-seventh of the total membership of 350, a resolution was passed by a majority of three that this association should give the required three months' notice to withdraw from the agreement. The agreement, it will be remembered, is between the Textile Council, composed of representatives of all the unions, and the manufacturers, and of course could not be terminated except by an adverse vote of a majority of the unions.

The action of the spinners, however, called attention to the dissatisfaction of some of the workers, and meetings of the other unions were called. The carders voted in favor of continuing the agreement, the loom fixers voted for the continuance, but recommended that the agreement be revised, while the weavers referred the matter to the Textile Council with the request that an effort be made to revise the plan in any way which might make it more satisfactory. Thus the action of the spinners brought about a general discussion, the tenor of which was that this union had been in error when it brought the charge that the "sliding scale agreement had proved a failure so far as the workers are concerned." It was shown that throughout the year during which this agreement had been in force the maximum wage had been paid, altho during the second half of the year the manufacturers' profits had disappeared, and in most instances had been changed to a loss. The reduction of nearly 18 per cent., while very heavy, was from the highest rate paid in Fall River in the past thirty-six years, and left a wage nearly 10 per cent. above the minimum under the agreement, and 23 per cent. above the lowest wages on record which prevailed in 1904 and 1908: a cut of nearly the same amount had been previously made when the regulation was a matter of the will of the stronger side; and, most important consideration of all, wages had two months previously been fixed for six months on a basis of 19.66 cents per cut, at a time when the actual margin was equivalent to a wage basis of only 16 cents,—a rate which had been twice paid when market conditions were no worse. Fortunately, the better judgment of the majority prevailed, and the spinners withdrew their objection after a conference had been held to revise the plan, as suggested by the loom fixers and weavers.

This revision consisted in fixing the points at which

wages were to be changed at 2½ instead of 5 points, and is illustrated in Table V.:—

TABLE V.

With a Margin of		*With a Margin of*	
115 points	23.96	95 points	21.23
112½ "	23.69	87½ "	20.96
110 "	23.42	85 "	20.69
107½ "	23.14	82½ "	20.18
105 "	22.87	80 "	19.66
102½ "	22.59	77½ "	19.17
100 "	22.32	75 "	18.68
97½ "	22.05	72½ "	18.00

The maximum and the minimum here remain the same: the only difference is in increasing the number of points at which revision takes place. It is provided that there shall be no change in the price on either the ascending or descending scale unless the margin shall have reached a point in the above schedule. Reductions and advances are not to take place until two weeks after the end of the period upon which wages are based for the next six months. When in November, 1908, the time came to fix the rate of wages to be paid for the six months ending in May, 1909, it was found that the margin called for a reduction of 8 per cent. The manufacturers, however, voluntarily waived their right to demand the reduction; and wages were continued at the rate then in force. This action of the employers came as a pleasant surprise to the operatives, and has done much to further that better unstanding between capital and labor which, in the cotton industry, is steadily increasing.

This, then, is the present situation of the wage question in Fall River. The plan for a sliding scale of wages, first tried and found wanting, but afterwards perfected, is still in force and meeting with the approval of both parties to the agreement. It has stood the test of a

period in which the maximum of wages was paid when all profits in the business had disappeared, and under its operation the workers have accepted one of the largest reductions of wages known in the history of the industry. The plan has brought vividly to the attention of both the manufacturers and the operatives a realization of their common interests, and has revived, in a measure, that sense of partnership between the man who buys labor and the man who sells it which once existed in the earlier stages of our industrial development.

JONATHAN THAYER LINCOLN.

FALL RIVER, MASS.

LOCAL DISCRIMINATION IN TRANSPORTATION.

SUMMARY.

Examples of anomalies, 470.—Hadley's oyster case not conclusive, 472.—Two variants: lower long-haul rates by the roundabout route, as in the Hillsdale, Youngstown, and some Southern cases, 474; or by the direct route, as in the Nashville-Chattanooga and other Southern cases, 480.—Complicating influence of water transportation, 488.—Market competition from various regions a different case, 489.—The basing point (Southern) and basing line (Missouri River) systems, 494.—Their inevitable instability and probable ultimate abandonment, 498.—Postage-stamp rates, illustrated by transcontinental tariffs, 499.

ANY unreasonable departure from a tariff graded in some proportion according to distance is known as local discrimination. It constitutes one of the most difficult and perplexing problems in transportation. Personal discrimination now happily having been practically eliminated since the enactment of the Elkins Amendments to the Act to Regulate Commerce, this issue of local discrimination becomes of primary importance.

"A merchant of Wilkesbarre, Pennsylvania, purchased a carload of potatoes at Rochester, New York, and had the freight bill made for a delivery to Philadelphia, because the freight to Philadelphia was less than it was to Wilkesbarre, which is 143 miles nearer. He stopped the potatoes at Wilkesbarre, unloaded them, and paid the freight. A few days later he received a bill from the Lehigh Valley Company for $12 additional freight. If the potatoes had gone to Philadelphia, he would have paid $48 freightage. As they stopped at Wilkesbarre, he had to pay $60; that is, $12 for not hauling the carload 143 miles.[1]"

[1] Cullom Committee Report, Testimony, p. 532. *Cf.* instances in Hudson's Railways and the Republic, and Parsons's Heart of the Railway Problem.

"A merchant in Montgomery, Alabama, shipped two carloads of fruit jars from Crawfordsville, Indiana, to Montgomery. He shipped them to Mobile and then paid the local rate from Mobile back, those fruit jars going through Montgomery on the way out. By having them hauled 350 miles farther, he saved $75 on the two carloads."

On first-class goods, at one time, the rate from Louisville to Montgomery was $1.26 per hundredweight. On to Mobile, 180 miles further south, it was only 90 cents. In the same territory the rate on kerosene oil from Cincinnati at times has been three times as much to interior points as to New Orleans, three times as far. West of the Missouri River and in the Rocky Mountain area similar complaints are common. Denver, Colorado, pays $1.79 per hundredweight on cotton piece goods, in small lots, hauled 2,000 miles from Boston; while the rate to San Francisco, 1,400 miles further away on the same line is only $1.50. This discrepancy is even greater in wholesale rates. No carload rating is given to Denver; while for similar shipments to the coast the rate is only $1 per hundredweight. In the opposite direction, sugar is carried from San Francisco through Denver to Kansas City for 65 cents per hundredweight, as compared with a rate of $1 if the sugar is stopped at Denver. Smaller places in the West afford equally striking instances. The rate on rope from San Francisco to Independence, Kansas, is 75 cents; while the same goods are hauled on through Independence, Kansas, much farther, to Missouri River points for 60 cents per hundred pounds. Wichita, Kansas, complains that cotton piece goods from New York by way of Galveston are rated at $1.36; while by the same route to Kansas City, 225 miles longer haul by that route, the charge is only 93 cents. The Southwestern Lumberman's Association complains,—

that a train of cars of lumber starts from Camden or other common point in Texas via Atchison, Topeka and Santa Fe Railway, and one car is dropped off in Oklahoma at 27½ cents per 100 pounds; one each also at Wichita and Emporia, Kansas, at 27½ cents per 100 pounds; one at Kansas City at 23 cents, and two cars also set off this same train at Kansas City, destined for Omaha and Lincoln, Nebraska, at 23 and 24 cents per 100 pounds, respectively. The balance of this train, now at Kansas City, runs on to Chicago, and 24 cents per 100 pounds is the charge then for most of the train which is left there. . . . Why should builders of homes in Wichita and Emporia, Kansas, pay higher freight than builders in Kansas City, Omaha, and Chicago when using yellow pine from Texas?[1]

Such instances as these might be multiplied indefinitely. They are often striking in character. The first impression is of intolerable abuse. The simplest tenets of justice and fair dealing appear to be violated. Careful analysis should, however, always be made before drawing such conclusions. Railroad practise seldom departs so flagrantly from the fundamental consideration of cost of service without very substantial economic justification.

The reasoning underlying local discrimination is admirably set forth by President Hadley in the following passage from his *Railroad Transportation:*[2]—

On the coast of Delaware, a few years ago, there was a place which we shall call X, well suited for oyster-growing, but which sent very few oysters to market, because the railroad rates were so high as to leave no margin of profit. The local oyster-growers represented to the railroad that if the rates were brought down to one dollar per hundred pounds, the business would become profitable and the railroad could be sure of regular shipments at that price. The railroad men looked into the matter. They found that the price of oysters in the Philadelphia market was such that the local oystermen could pay one dollar per hundred pounds to the railroad and still have a fair profit left. If the road tried to charge more, it would so cut down the profit as to leave men no

[1] Elkins Committee Report, 1905, p. 1892.

[2] Pages 116–117.

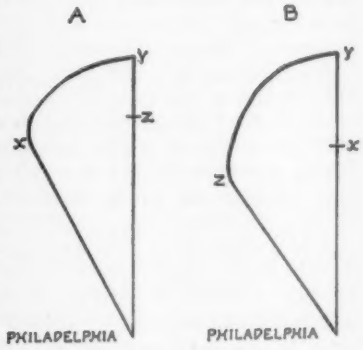
inducement to enter the business. That is, those oysters would bear a rate of one dollar per hundred, and no more. Further, the railroad men found that if they could get every day a car-load, or nearly a car-load, at this rate, it would more than cover the expense of hauling an extra car by quick train back and forth every day, with the incidental expenses of interest and repairs. So they put the car on, and were disappointed to find that the local oyster-growers could only furnish oysters enough to fill the car about half full. The expense to the road of running it half full was almost as great as of running it full; the income was reduced one-half. They could not make up by raising the rates, for these were as high as the traffic would bear. They could not increase their business much by lowering rates. The difficulty was not with the price charged, but with the capacity of the local business. It seemed as if this special service must be abandoned.

One possibility suggested itself. At some distance beyond X, the terminus of this railroad, was another oyster-growing place, Y, which sent its oysters to market by another route. The supply at Y was very much greater than at X. The people at Y were paying a dollar a hundred to send their oysters to market. It would hardly cost twenty cents to send them from Y to X. If, then, the railroad from X to Philadelphia charged but seventy-five cents a hundred on oysters which came from Y, it could easily fill its car full. This was what they did. They then had half a car-load of oysters grown at X, on which they charged a dollar, and half a car-load from Y on which they charged seventy-five cents for exactly the same service.

Of course there was a grand outcry at X. Their trade was discriminated against in the worst possible way—so they said—and they complained to the railroad. But the railroad men fell back on the logic of facts. The points were as follows: 1. A whole car-load at seventy-five cents would not pay expenses of handling and moving. 2. At higher rates than seventy-five cents they could not get a whole car-load, but only half a car-load; and half a car-load at a dollar rate (the highest charge the article would bear) would not pay expenses. Therefore, 3. On *any* uniform rate for everybody, the road must lose money, and 4. They would either be compelled to take the oyster car away altogether, or else get what they could at a dollar, and fill up at seventy-five cents. There was no escape from this reasoning; and the oystermen of X chose to pay the higher rate rather than lose the service altogether.

The logic of this oyster case seems convincing in its simplicity. But it presents more complications than appear at the outset.

First of all, what is the nature of the competition at the more distant point which is alleged to "compel" the lower rate? Is it merely of rival routes or of competing markets? It will be advisable to keep the two distinct so far as possible. Under the first heading, competition of routes, the subjoined sketches represent two possible situations. In both instances, however, Y, enjoying the lower rate, is more distant from Philadelphia than X. The difference between the two arises from the fact that in the one case X is nearer Philadelphia than Y on a roundabout line; while in the other X is actually nearer than Y by the shortest direct route. We may safely assume that the compelling competition alleged at Y as justifying the lower rate is by rail; as, the commodity being a marine bivalve, both places presumably enjoy equal facilities for water carriage. At all events, assuming that we have to do with competing rail routes alone, what differences obtain between the two sets of circumstances above sketched? Not insignificant inequalities in the length or power of the two routes are implied by the diagrams. They are supposed to represent substantially different lines, which may, for the purposes of the argument, be denominated strong, natural, or standard, and weak, unnatural, or abnormal, respec-



tively, so far as the particular traffic in hand is concerned. That this distinction is not irrelevant, but frequently of determinant force, is shown by an analysis of concrete cases which have arisen for adjudication.

This proposition is clear beyond dispute. The actual cost of service, which fixes an irreducible minimum rate between Y and Philadelphia, is less on the short line than by the roundabout one. For either road to accept less than the portion of the cost traceable to this particular traffic, that is to say, the *extra* cost incident to its acceptance, is economically inconceivable. From this it follows, other conditions being equal, that the shortest line between Y and Philadelphia rules the rate in the last instance. This is normally the case. The roundabout route thereafter merely accepts the rate thus compelled. To permit the roundabout line to rule the minimum rate would not only violate a fundamental principle of operation: it would inevitably lead to chaos. The analogy with cut-throat competition in business is obvious. It is equally plain that the mere acceptance of a short line rate by a roundabout road, so long as this rate is adequate to yield some profit over the extra cost, while of advantage to some, may not work positive injury to any one. This condition normally corresponds to the state of affairs represented by diagram A. The nearer point, X, as Hadley avers, has no just grievance against Y because the latter has the good fortune to have a direct service to Philadelphia at a low rate. For Y to withdraw shipments from the line via X might even destroy the only chance of X for a market. It would also deprive Y of whatever benefit it might have derived from competition either of routes or of facilities. Of course, we have expressly omitted market competition as a factor, reserving it for separate treatment. Yet one objection arises. Normally, the direct line ought to maintain a

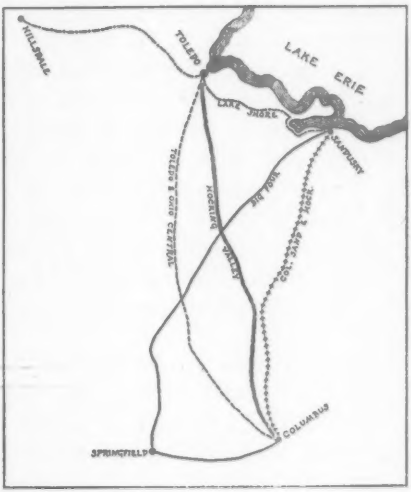
tariff conforming in some degree to the distance principle. The roundabout line can compete at Y only by a violation of it, unless, indeed, its local tariffs be graded much more gradually. In other words, its progression towards the maximum must be distributed over a much longer line. Even this would, on Hadley's statement of fact, eliminate X from the Philadelphia market. Such reduction of local rates upon the roundabout route would in turn discriminate against places like Z on the direct line, equally distant with X from Philadelphia. For the latter places would necessarily be assessed at a higher rate per ton-mile.[1] This would constitute another form of local discrimination, which will be discussed in due time. There is, therefore, at best, only a choice of adjustments, either of which leads to some form of inequality. But, upon the whole, balancing the evil with the good, the first variant of our oyster case appears to be best solved by according all shippers at Y a somewhat lower rate than X enjoys.

Conditions corresponding to diagram A have frequently given rise to complaints before courts and administrative tribunals. An interesting illustration is afforded by the Hillsdale ice case in Michigan.[2] Ice was moved from this town to Springfield and Columbus, two neighboring Ohio cities, over several different routes. To Columbus the shortest road, as the sketch map shows, was by the Hocking Valley Railroad directly through Toledo. Another route by way of Sandusky existed; and even a third through Sandusky, thence over to Springfield, and in by the side door, so to speak, to Columbus. This last routing was due to the fact that the Big Four road from Sandusky diagonally across to Springfield had no access

[1] An instance is afforded by the Savannah Freight Bureau case. See Ripley, Railway Problems, p. 286 *et seq.*

[2] Interstate Commerce Commission Reports, decided May 14, 1903.

to Columbus except through a branch line from Springfield. This last-named zigzag route was 295 miles in length as against 190 miles by the direct line through Toledo. To Springfield, on the other hand, no direct route from Hillsdale existed; but freight might move either via Sandusky by the Big Four road or through Sandusky and around by way of Columbus. The short-



est of any of these lines to Springfield, however, was 29 miles longer than the shortest line to Columbus. This established Columbus, therefore, as normally the nearer point. Complaint arose from the fact that ice carried over the zigzag route to Columbus actually passed through Springfield and 45 miles beyond to reach its destination. For such shipments over the Big Four road, Springfield instead of Columbus was the nearer point. But, contrariwise, for ice coming to Springfield through Columbus,

the latter in turn became the intermediate point.[1] The specific complaint was that the rate by all routes to Springfield was $1 per ton, while to Columbus it was only 80 cents. Originally, the rate was higher ($1.25 per ton), but was the same to both points. Is this a case of local discrimination or not? The Big Four road operating through Springfield answered that it was not responsible for the 80-cent rate to Columbus; that this was made by the direct line; and that it obviously must meet this rate or withdraw from the ice business. It alleged, moreover, that the rate of $1 was reasonable in itself as compared with other rates in the same territory, and was in fact substantially less than it formerly was; nor would its withdrawal from Columbus ice business evidently be of any advantage whatever to Springfield, but would indeed deprive it of some small contribution to joint expenses of operation on all its tonnage. No evidence being offered that Springfield was positively injured by this adjustment, the Commission properly dismissed the complaint.

The distinctive feature of this class of cases, as has been said, is that the intermediate point preferring the complaint is always on a roundabout route.[2] St. Cloud, Minnesota, whose contention is described hereafter in detail, was thus situated. The so-called "rare and peculiar" case of Youngstown, Ohio, cited in the original Louisville and Nashville decision of 1889, was in no sense different. It was a case of pure competition of routes.[3] Traffic to New York was starting its journey from Pittsburg, over the rails of the same company, in exactly

[1] This recalls Traffic Manager Bird's testimony relative to Wisconsin controversies before the Elkins Committee, , p.

[2] Using this term technically as described on p. 475, *supra*.

[3] The original correspondence setting forth these conditions is reprinted by the Senate Committee on Interstate Commerce, Hearings, 1905, Digest, Appendix III., p. 46.

opposite directions. Some of it went east by the direct line; while other freight first moved due west, thence north, by way of Youngstown, Ohio, until it reached the main line of the Erie, which took it on to New York. This traffic, therefore, described three sides of a rectangle in reaching its destination, traversing a route 172 miles longer than by the direct line. The issue was raised by a demand for as low a rate to New York from Youngstown as Pittsburg enjoyed, on the ground that it was nearer New York by this indirect line; Pittsburg traffic, in other words, passing through it *en route* to the seaboard. The reply of course was that, although nearer by an indirect road, it was more distant by the natural and shortest route, and consequently should pay more for the service. What the roundabout line was really demanding was permission to compete at Pittsburg for New York business, without being compelled to reduce its local rates from intermediate points like Youngstown. In other words, the long line was demanding exemption from the long and short haul clause, while the direct short line conformed to it. Without such exemption it could not continue to reach out for Pittsburg business, as the loss incident to reduction of its local rates would outweigh the profit in the competitive tonnage.

One side of the Savannah Freight Bureau Fertilizer case[1]—namely, the complaints of local stations on a roundabout road—brings it within our first category. A roundabout line was 413 miles long as against a direct route of only 273 miles. Kathleen, Georgia, was only 288 miles out from Charleston on this indirect line,—approximately the same distance as Valdosta, which thus corresponds to Y in the oyster case. Yet Kathleen paid a rate of $3.32 per ton on fertilizer from Charleston

[1] Ripley, Railway Problems, p. 298.

as against $2.48 charged to Valdosta, 125 miles beyond. But this excess distance was by an indirect route. Most of the notable English cases concerning local discrimination appear to be of the same stamp.[1] The complaints of a number of smaller places in the St. Paul-Milwaukee territory, like Cannon Falls, Lacrosse, and Northfield some years ago, reduce in part to the same thing.[2] Whether the Troy, Alabama, and Wichita, Kansas, cases belong here or in the next group is indeterminate, owing to the difficulty of comparing conditions of carriage by rail and by water, respectively.[3]

On the other hand, the set of circumstances shown in diagram B (page 474, *supra*) is of quite a different sort. The justification for the local discrimination is much less clear. Here, as before, the distant point Y enjoys a lower rate than X because of the presence of competition; but it is important to inquire both as to the nature and the amount of it. In the first case, competitive traffic from Y was *extra* rather than normal in character, so far as the line serving X was concerned. It was relatively small in amount. Whatever surplus revenue resulted from it aided the local tariffs, including those at X, in supporting the burden of fixed expenses. This burden they were bound to bear entirely in the absence of competitive business picked up at Y. The distant point Y of course had no complaint in any event, and the chances are that X was benefited, as we have seen. But in this second case the great bulk of the traffic from Y belongs naturally to the direct line through X. It constitutes the mainstay of its business. The direct line, unlike the roundabout one, cannot withdraw from the field when rates become unremunerative. It is in this

[1] Brief of Ed. Baxter, Alabama Midland Railway Case, United Sates Supreme Court, p. 71; and Acworth, p. 83.

[2] *Cf.* Interstate Commerce Commission Report, xiv. p. 209. [3] See p. 488, *infra*.

business passing directly through X to stay. Nine-tenths of the Y traffic perhaps moves through X in this latter case: in the former one, one-tenth would perhaps measure the proportion of the indirect line. Under this assumption, it is obvious that the question of the level of rates at Y, as determined by the presence of competition, assumes a ninefold greater importance in the eyes of X, so far as the effect upon local rates in supporting the fixed and joint expenses of the road is concerned. In any event, even the line operating under a disability supposedly earns some small net return on competitive traffic, else it would withdraw from the field. This it is in fact free to do at any time; and, however small the net return, it is at least all gain. On the other hand, when the net return on a large volume of its natural business becomes unduly small, the financial stability of the direct line is put in jeopardy. The danger of local rates (as at X) being actually enhanced or at least prevented from reduction, because of an unduly low level of competitive rates at more distant points, is thus much greater when X is a way station on a direct line than when, as in our first instance, it is an intermediate point on a roundabout route. For this reason the direct line through X is at the outset put to a justification of its local tariffs, as to whether they are inherently reasonable or not: first, by comparison with the general level throughout the surrounding territory; and, secondly, as yielding a return on the capital actually invested. This seems to have been the line of reasoning which the Interstate Commerce Commission adopted in the recent important Spokane, Washington, cases.[1] The low through rates to the Pacific coast were established as reasonable by the competition of sea routes round the Horn, and especially

[1] Interstate Commerce Reports, Opinion No. 820, decided February 9, 1909. *Cf.* also the Denver, Colorado, decision No. 951, for March 2, 1909.

by the newly-opened Tehuantepec Railroad. The only ground for finding there was discrimination against Spokane was an inherent unreasonableness in its rate. This was, in fact, the outcome, the decision being rendered notable, further, by reason of the prominence given to the valuation of the railroads' property as a basis of judgment.

The first important point to be established, then, in this second variety of the oyster case was as to the relative distribution of traffic from the more distant competitive point by the several lines open to it. The next concerned the absolute reasonableness of the rate at the intermediate point. In the third place, we must inquire whether the rate at the more distant point may not be unreasonably low. This was a contingency not possible, as we have just seen, in the Spokane case. But others may be different in this regard. One is thus forced to consider the effect upon the level of rates at the more distant point of the presence of roundabout competitive lines. An indirect rival road may, as in the St. Cloud case, carry only 73 carloads a day as compared with a daily movement of 1,000 cars by the direct lines. On the other hand, as in the Savannah Freight Bureau case, Valdosta, Georgia, may receive nine-tenths of its supply of fertilizer by indirect roads. But in any event it is the potential, not the actual movement of tonnage, which may count in the long run. It is indisputable that the short line between two points never pares its rates down to an irreducible minimum except under compulsion. The presence of a roundabout route affords just this pressure to reduction. Even allowing that in the last analysis the long line will strike bed-rock of no profit first, it is indisputable that such lines frequently, instead of merely meeting rates made for them by the direct routes, seek to divert business by actually undercutting those rates.

Having only a small share of the tonnage, they take risks which would be fatal to others. To transport at an absolute loss is of course no more defensible than the argument of the merchant that the only way to compensate for selling goods below cost was to enlarge the volume of his business. But, of course, there is always the chance that, by enlarging this volume sufficiently, operating expenses may be so far cut down that a loss may be transformed into a profit. The diversion of enough traffic from the direct railroad line to accomplish this end would, of course, reduce the volume of its traffic and thereby unduly burden it, to the manifest injury of all local points like X.

Suggestive illustrations of lower rates at the more distant point than are under the circumstances actually "compelled" by competition of routes are to be had. In a recent case[1] the rates on bananas from Charleston, South Carolina, to Danville and Lynchburg, Virginia, respectively, were called in question. The traffic moved through Danville on its way to Lynchburg, 66 miles beyond, at a rate of 43 cents to Danville as compared with a rate of 20 cents to Lynchburg. The reason for the low rate at Lynchburg was the presence of a rival route,—bananas coming in through Baltimore. But the lowest rate "compelled" by this competition was in fact 13 cents higher than the Danville line charged at Lynchburg. In other words, the long-distance rate was that much lower than it need have been. This instance is analogous in another way to our oyster case, inasmuch as, the demand at Danville being limited, one-half of the same carload paid the Danville rate of 43 cents, while the other half went on at the lower rate of 20 cents enjoyed at the more distant point. It is in this connection,—of rates unduly low at so-called competitive points,—that the partial weakness in the railroad arguments in many of

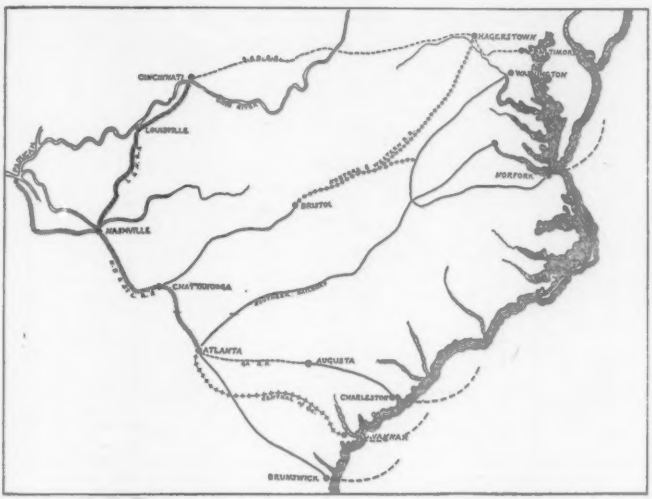
[1] Interstate Commerce Reports, No. 696, decided June 25, 1904.

the Southern basing point cases appears. Since the Supreme Court of the United States has held that competition at the more distant point justifies its lower rates, the Interstate Commerce Commission is powerless to give effect to whatever opinion it may entertain that at times it is neither water nor commercial competition which actually brings about the low rate at the basing point; but merely a consensus of opinion among carriers that that place will respond quickly enough to favors granted, to make it worth while to try the experiment.[1] This conviction is vastly strengthened of course since entire monopoly among all the southern railroad lines has become an established fact. It is an absurdity to speak longer of any competition between rail carriers existing in a large part of this territory.

Actual illustrations of this second variant of the oyster case, free still from the complications of competition of markets, are not common, but occasionally arise. Chattanooga, which aspires to be the commercial and industrial center of eastern Tennessee, is about 150 miles southeast of Nashville, as the sketch on page 485 shows. Owing to the south-western trend of the Appalachian Mountain valleys, it is only 846 miles from New York by rail, almost as the crow flies; while Nashville has access to the North principally through Ohio River gateways, over lines, at the best, 1,058 miles in length. By these lines, therefore, the latter is 212 miles further from New York than Chattanooga. But the two competitive places are only 151 miles apart: whence it follows that the shortest possible all-rail line from New York to Nashville, swings around to the south by way of Chattanooga. The situation is complicated by other combined rail-and-water routes from New York through Norfolk, Savannah, and Charleston. But all these lines also reach Nashville by

[1] *Cf.* the opinion in the Savannah Fertilizer case, Ripley, *op. cit.*, p. 299.

coming up through Chattanooga. From every point of view, therefore, Chattanooga, on the basis of mileage is the nearer point to New York: 151 miles nearer by the

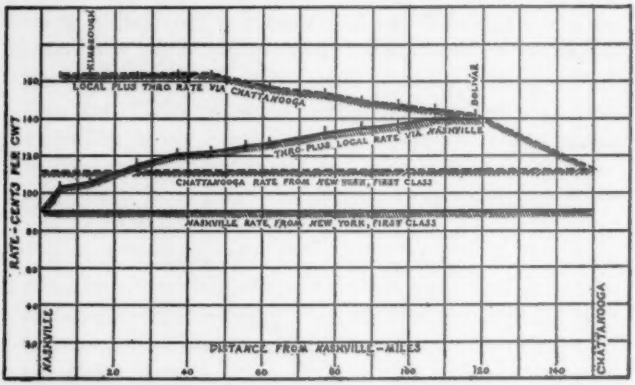


direct line, all rail; equally nearer by all combined rail-and-water routes; and 212 miles nearer than is Nashville by the roundabout all-rail lines through Louisville or Cincinnati. Its location corresponds to X in our second variation of the oyster case; namely, an intermediate point on the direct line to another more distant point Y, which latter enjoys the competition of more roundabout routes.

The disability against Chattanooga, against which it protested, was substantial.[1] Its first-class rate from New York was $1.14 per hundred pounds, while Nashville

[1] The full statement of this case is reprinted in Ripley, Railroad Problems, pp. 238–268.

paid only 91 cents. On various commodities the Chattanooga rates were from 25 to 75 per cent. above those to Nashville. The effect of such differences upon jobbing business at the places intermediate between Nashville and Chattanooga is shown by the subjoined chart. The two upper sloping lines represent the through rates



from New York to each distributing center, plus the local rates out to way stations. Even at Bolivar, the nearest place to Chattanooga, the Nashville combination is slightly lower than that based upon Chattanooga. This disability steadily increases as Nashville is approached, rates from Chattanooga rising while those from Nashville fall, until at Kimbro the jobber located at Chattanooga—the nearer point to New York on the direct line—must lay down his New York goods at a rate of 63 cents a hundred pounds higher than his competitor in Nashville enjoys. This adjustment is partly an historical product. Nashville, by the old river routes from Pittsburg down the Ohio and up the Cumberland, was formerly nearer the Eastern cities than Chattanooga. Then, the trunk

lines through Cincinnati with heavy traffic and low rates shortened the distance; and, finally, the Louisville & Nashville Railroad, supplanting the river routes, undertook to build up Nashville as against Cincinnati and Louisville. Historically, on the other hand, Chattanooga was long an unimportant point. It took, as it still does, the same rate from the north as prevailed at some 23 other Southern cities from Atlanta to Memphis. Here is the crux of the difficulty. The rates at Nashville must be assumed as historically fixed. Whatever remedy may apply must come from a reduction of the rates to Chattanooga, the nearer point. This place has now become an important center, the meeting point of a number of rail and water lines. The long-prevalent grouping of all the Southern cities with equal rates from the North must be replaced by a system of differentials, if the discrimination against Chattanooga is ever to be ameliorated.

By this time it will be observed that in the discussion of the Chattanooga case we have drifted far beyond the mere competition of rival routes. Commercial competition, which affords the justification for grouping all these twenty-three important Southern cities together, is a topic to be treated elsewhere by itself. The difficulty in many of these cases is to distinguish between the really strongest line and the one which is merely the shortest. Upon this point one's decision of the Chattanooga case might actually depend. The Louisville & Nashville contends that Nashville even to-day is, from an operating point of view, nearer New York than Chattanooga, altho the distance is 212 miles more. All the Trunk Lines compete at Ohio River points, and bring them relatively much closer to New York. The density of traffic on these lines is far heavier than on the air line to Chattanooga.

It happens that Chattanooga meets this allegation of greater trunk line density and cheapness, by proof of the

still greater economy of operation by the coastwise steamers to Southern ports, traffic coming thence north by rail through Chattanooga. The appearance of water competition in any of these cases always introduces an almost insuperable difficulty in the way of comparison of long and short lines. Shipment by vessel differs from rail carriage, primarily in the relatively high terminal costs, the absence of all maintenance of way costs, and the low cost of actual propulsion. With a cargo once securely stowed, the distance traversed by a vessel is of relatively little importance, much less so than in the case of carriage by rail. A powerful factor in determining water rates moreover, especially by sea, is the absence of local traffic. Wharves and terminals being expensive to build and maintain, and the method of loading in a ship's hold not being conducive to ease in access or assortment, vessels are confined largely to bulk traffic at a few important points. The expenses of operation must be more uniformly distributed over the cargo than in the case of a train load. The water line, therefore, is deprived of one advantage in cutting rates. It cannot, so readily as a railroad, recoup itself for losses on competitive business or at competitive points by falling back upon its earnings from way stations.

From all these considerations it not infrequently comes about that, unlike carriage by rail, the longest way round may indeed be the shortest way home. This is clear in the highly involved Wichita, Kansas, cases. Wichita, a commercial center of southern Kansas, is 200 odd miles south-west of Kansas City. Its all-rail rates from the East are higher than to Kansas City. Yet by the water route from New York to Galveston and thence up by rail, as compared with Kansas City, it is a nearer and intermediate point. The Interstate Commerce Commission well expresses the difficulty:—

It is quite probable that the actual cost of transporting cotton piece goods from New York to Wichita via Galveston does not exceed that of carrying them from New York to Kansas City via the cheapest route. The all-rail haul is to the latter point 1,300 miles and over. The ocean-and-rail movement involves a rail carriage of from 1,100 to 1,300 miles, depending upon the route selected. If the goods move through some Gulf port, there is a rail carriage of not less than 850 miles. If, therefore, the rate were to be measured by the expense of the service, it is probable that Wichita would to-day enjoy as low a rate as the Missouri River.

Summarizing the results so far reached, in all that concerns the two sorts of cases considered in the preceding paragraphs, our conclusion is that, when competition by rail at the distant point is alone present, and when the nearer point is on a roundabout route, a railway "is entitled to carry the traffic from Y past X to Philadelphia for considerably less than nothing"; but, when the nearer point is on a direct line, the case is debatable. Proof that normal competition compels the lower rate at the remoter station must be uncommonly clear and conclusive. In other words, the facts that the rate at Y is not unduly low and also that the rate at X is not unreasonably high must both be firmly established.

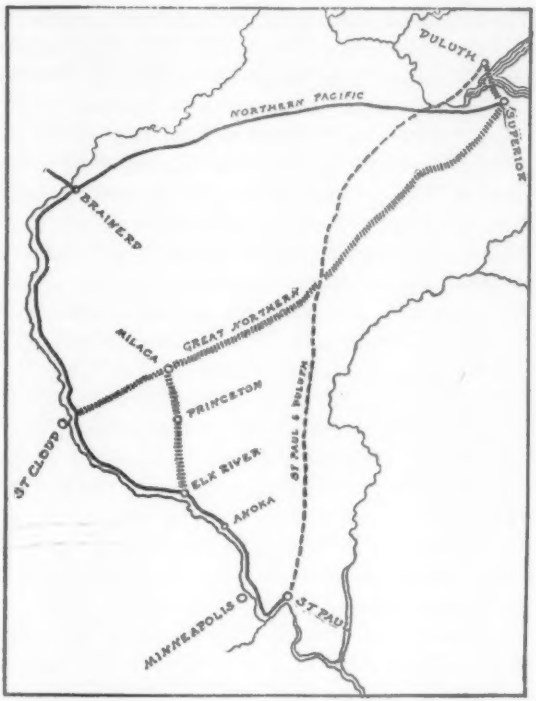
The question has forced itself forward constantly as to whether the existence of the alleged discrimination in rates is merely a matter of relativity in cost of operation or whether it inflicts positive injury upon the nearer point. Would it benefit the nearer point if the lower rate beyond were withdrawn? It is here that the complexity of some of these cases of local discrimination becomes apparent. To understand this phase of the matter, the factor of commercial competition, as distinct from mere rivalry of routes, must be introduced. Hadley's analysis of the oyster case is quite inadequate on

this point. Rates in that instance were on commodities (oysters) produced at practically uniform cost at both X and Y. They were, moreover, rates *from* two places out to a common market. Would it, however, make any difference if the controversy concerned the rates in the opposite direction; or, in other words, from a common center of distribution out to two competing consuming points? Would it make any difference whether the goods were to be consumed at X and Y; or were to be used as raw material in manufactures at those two points; or were to be distributed throughout the countryside from X and Y as jobbing centers? It is at once evident that these issues are more complicated than in the first case. The two points X and Y being commercial and industrial rivals, is it not possible that the growth of one may take place at the expense of the other? At any given time there is only a fixed demand for the goods consumed, manufactured in or redistributed from the two places. Trade won by one is quite lost to the other. Of course, in a measure, this might also have been true of the oyster production. But, inasmuch as in that case the rate from Y was not affected by the entry of X, its prosperity would not probably be disturbed. The Hillsdale ice case, above described, is also one where the commodity (ice) is of relative unimportance for Columbus and Springfield, respectively. How would matters stand if the rates in question were on lumber or coal for manufacturing purposes? The difference, no doubt, is merely of degree and not of kind. Magnitudes, however, must not deceive us. The rights of Kathleen or Danville are just as sacred as those of Chicago and Pittsburg.

St. Cloud, Minnesota, is located upon a line of the Northern Pacific Railroad, 76 miles northwest of St. Paul.[1] It

[1] The St. Cloud decision of the Interstate Commerce Commission is reprinted in Ripley, Railway Problems, pp. 269–285.

is a competitor not only with St. Paul, but with other local centers in the vicinity, like Elk River, Princeton, and



Anoka, either for flour milling or for distributive jobbing business. It is about the same distance as these other places from Duluth or Superior; through which the entire district obtains its supplies, such as coal, from the East by lake boats; and by way of which its flour must be shipped to the Eastern markets and to Europe. And yet the rate on flour made at St. Cloud to New York in 1899 was 28½

cents per hundredweight as against a rate of 21½ cents from St. Paul, this latter rate being enjoyed also by Milaca, Princeton, Elk River, and Anoka. The rates on coal and other supplies from the East were likewise proportionately higher than to St. Paul and these neighboring towns. The specific complaint in this case is of local discrimination. The Northern Pacific Railroad operates the long line between St. Paul and the head of Lake Superior by way of Brainerd. On this business, passing through St. Cloud, it has to meet a rate compelled at St. Paul by the competition of no less than three direct lines to Duluth. It avers that this business, taken either way for longer distances and at lower rates than are accorded to St. Cloud, in no way affects the rates at that point; and that whatever it can earn as a contribution to joint expenses decreases the burden of these upon St. Cloud rates. This is all entirely true from the transportation point of view; but, viewed in a large way, the situation is altered. Wheat of local production about St. Cloud is rendered of less value by practically the excess of the St. Cloud rate per hundredweight over the rate enjoyed from St. Paul. The Interstate Commerce Commission found that this was equivalent to a difference of fully $1 per acre in the value of wheat lands tributary to St. Cloud. And on the other hand, of course, the cost of all its supplies is enhanced above the level of rival manufacturing centers. On soft coal this equalled no less than 85 cents per ton. To this the Northern Pacific replied that the discrimination against St. Cloud was not of its creation, but had existed before its entry into any St. Paul business by its indirect route. The Commission found, however, that in fact the participation of this indirect line in St. Paul-Duluth business did affect the short-line rate; and that its withdrawal would at least tend to prevent any further reduction of the St. Paul and related rates. If

the withdrawal did not remove the discrimination against St. Cloud, it would not at all events aggravate it. The vital point, differentiating this case from that of the Savannah Freight Bureau, previously stated, was the actual damage to the intermediate point due to the existence of commercial competition between it and the place more distant.

An important feature in commercial competition is its entire dissociation from all considerations of cost of service by long or short routes. Neither strong nor weak lines make the rate. The business is there. Market conditions are fixed. The carriers are free to take traffic or leave it. Single-handed, at least, they cannot rule the price of transportation. The price of sugar at Kansas City is made by competition of Louisiana sugar coming from New Orleans, of beet sugar and Hawaiian sugar from Colorado and San Francisco, and of the world's sugar from New York. This is why Kansas City, in the complaint stated in the opening paragraph, enjoys a lower rate on sugar from San Francisco than the transcontinental lines can accord to Denver. The only possible justification for the apparent anomaly in lumber rates from Texas points, cited in the same paragraph, is that, as the heart of the Middle West is approached, lumber supplies from every point of the compass converge upon common markets. As is so frequently averred in such cases, no carrier makes the rate. The rate is made for all of them by conditions beyond their control. The only rates, therefore, which it is in their power to fix in some accordance with average costs of operation, are the rates at local stations. For these rates alone can they be brought to book.

Just here another characteristic of commercial competition as distinct from rivalry of routes is to be noted. Local discrimination, wherever it is alleged to occur, fre-

quently assumes the form of complaint against rates to various places, not on the same line but by different and often widely separated lines. Complaints of this class might arise, for instance, referring back to our diagrams of the oyster cases, between X and Z. Philadelphia, we will assume, as before, to be the common market. A multitude of different varieties of protest are distinguishable. Point X equally distant from Philadelphia with Z may pay a higher rate than Z. Or X may be less distant than Z, and yet be called upon to pay the same rate. It may even be less distant than Z and yet actually be charged a higher rate than Z. But in all these instances the two points (X and Z) are not on the same route, but on divergent routes. The issue remains the same. The conditions imposed at the point of convergence being fixed, each line must exercise its own ingenuity in conforming thereto. Methods in each case must differ, according to the length of line, the direction and composition of the traffic, and other factors.

Three general schemes of rate making are distinguishable in American practise. The most satisfactory one is that which obtains in Trunk Line territory,—of zone tariffs with a gradation in some degree corresponding to distance.[1] At the other extreme is the system of the flat or postage-stamp rate, exemplified in the Missouri-Mississippi River territory,[2] and in Pacific coast rates from all points east of the Mississippi.[3] Intermediate between the two are the systems of basing lines and basing points. The first of these, the basing line system, prevails throughout the country west of the Missouri River. The second, the basing point system, is found throughout the Southern States east of the Mis-

[1] Described in detail in Ripley, Railway Problems, pp. 309–322.

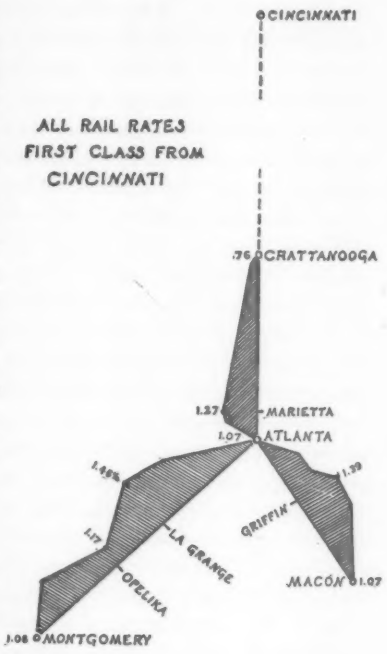
[2] Annals American Academy of Political Science, April, 1908.

[3] Ripley, *op. cit.*, pp. 405–440.

sissippi. In both the principle is the same. The two differ only in detail. Through rates are made to certain designated places; and from there on, a local rate to all other places, large or small, is added. This local charge rises, of course, with distance. Thus the first-class rate to Denver, Colorado, is made up of a rate of 80 cents from Chicago to the Missouri River, plus $1.25 for the balance of the haul. From Chicago to a point in central Nebraska the only difference would be a lower local. In Southern territory the rate to Troy, Alabama, equals the sum of the through rate to the nearest basing point, Montgomery, and of the local rate from there on to destination. The only difference in detail between these two systems is that in the Western territory, all competing lines being parallel (until the routes around by sea and back from the Pacific coast are met), rates rise in all cases progressively with distance. The complaint of local discrimination rests merely on the allegation that the rate of progression with increasing distance is too rapid. In the South, on the other hand, owing to the encircling seacoast with deeply penetrating navigable rivers, the competing routes from the East or North converge from different and even from directly opposite directions. Hence it is impossible to base rates upon extended boundary lines, like the Missouri River. Rates must be based upon certain designated points. This introduces a serious complication. Points instead of lines being used for basing purposes, in the South local rates rise outward in every direction around each basing centre until the sphere of the next basing point is met. And local rates to points even back on the same line through which the traffic has already passed to reach the basing point, are thus of necessity higher than rates to points beyond.

The economic anomaly of rates actually falling progressively as the length of the haul increases is graphi-

cally well illustrated in the accompanying diagram, based upon data in the Georgia Railway Commission cases. The charges from Cincinnati to local points on all lines converging upon Atlanta equal the sum of the rates to Atlanta plus the local charges out. This holds good even on the direct line from Cincinnati through Chattanooga, as the diagram shows; yet of course it also follows that rates must again decline as the next basing point is approached in any direction; be it Montgomery to the west, Macon to the south, or even Chattanooga to the north. The only condition analogous to this in the Far West appears in those places whose rates are made up by a combination of the low water rates to the coast plus a local back eastward into the mountains. The transition from this Pacific coast combination to the system based upon the Missouri River occurs at those places where the aggregate charges from either direction become equal. Viewed as a large matter of principle, the whole Western system is analogous to the Southern system. It is inevitable in



both that intermediate points should in all cases be assessed at a higher rate than those adopted as bases.[1]

The reason advanced in support of these basing point or basing line systems is that they are an outgrowth of commercial competition; in other words, that they are compelled by conditions beyond the carriers' control. Sometimes it may be the competition of widely encircling water routes: as from New York around to Galveston and up to Kansas City in the south-western field; or to Mobile and up to Montgomery, Alabama, in the south-eastern states. But, in many other cases, market competition from other centers of supply sets the limit to the rate at the basing point. Missouri River cities thus enjoy a great advantage over competitors, as meeting places of the ways. Generally, the low rates to the base points have been originally accorded in order to build up local distributive or industrial centers in the face of competition from older places. Nashville undoubtedly owes a large measure of its present prominence to the fact that in the old days its principal railroad gave a foothold and made a clientage for its merchants as against older rivals in Cincinnati and Louisville. Nor can it be said that this was an injury to that clientage, composed of consumers all through the adjacent countryside. Rates for these consumers were not put up, in order to build up Nashville. On the contrary, Nashville was given perhaps inordinately low rates, in order that the sum of these low rates and of the local rates out to Four Corners should be at least as low as those from Cincinnati and Louisville direct. This last argument is the main economic defence of the Southern basing-point system.[2] It applies equally to the advocacy of a low

[1] *Cf.* Commissioner Fifer's dissenting opinion in the St. Louis Business Men's League case, reprinted in Ripley, *op. cit.*, p. 439.

[2] Best elaborated by H. R. Meyer, Government Regulation of Railway Rates.

basing line at Missouri River cities for rate making to points beyond.[1]

The main difficulty with any system of basing points or lines, which so flagrantly violates the distance principle, is first of all to determine at what points to base; and thereafter to accommodate the system to the normal growth and development of the country. The system is inelastic. It tends to break down of its own weight. It must enlarge, if at all, by fits and starts, in each case with violent dislocation of trade. A generation ago towns in Iowa complained that the Mississippi River was a basing line. Then, when the Missouri River line was substituted, an outcry rose from all the points in Nebraska. The persistent complaint from Denver against its rate adjustment as compared with Kansas City,—a competitive distributing center,—well exemplifies it. The Denver Chamber of Commerce intervenes, and proposes that the basing line be moved from the Missouri River out to Colorado common points (like Denver). Indeed, in each case the argument in favor of the change is identical. Each tier of complainants—thriving cities which have recently come to more or less commercial maturity—plead their inability to compete with the centers adopted some years ago for basing purposes. Denver, for example, wishes to sell goods throughout Utah. But its total charges there on goods purchased in the East amount to 80 cents from Chicago to the Missouri River, plus $1.25 on to Denver, plus $1.64 on to destination,—a sum of $3.69 per hundred pounds. The Kansas City dealer, on the other hand, gets a low base rate of only 80 cents with a single additional rate directly out to Utah of $2.05. In other words, the latter can lay down his goods in Utah for $2.85 as against $3.69 paid by the

[1] The recent case, Interstate Commerce Commission Reports, No. 983, decided June 24, 1908, is best upon this.

Denver competitor. The point to be carried forward, however, is not so much the disparity against Denver, as the fact that the moment Denver is promoted to be a basing point it becomes defendant in a complaint of precisely the same sort, brought by the places still further west. This inelasticity of basing point schemes, together with their inability to expand without abrupt dislocations of trade, is apparent everywhere in the South. Just as Chattanooga complains against Nashville, so the little intermediate stations between Chattanooga and Atlanta, as our diagram on page 496 showed, become restive under rates of $1.27 as compared with a rate 21 cents lower charged on to Atlanta. The system of basing points or lines may be an inevitable concomitant of industrial immaturity; but it is none the less difficult to defend as a permanent system or as one inherently just. And its final relegation to the scrap heap, in favor of a system of rates graded more or less according to distance, is ardently to be desired.[1]

Does a constant rate applied over a long stretch on the same line constitute local discrimination? May the nearer points rightfully protest against the fact that equally low rates are accorded to remoter points? This is the gist of the controversy in the very suggestive Milk Rate cases in 1897.[2] Here the conflict of interest between producer and consumer is obvious. The city of New York naturally desires a wide market from which to draw its supply. On the other hand, the near-by pro-

[1] The feasibility of doing this in the South could all parties concerned be whipped into line, is demonstrated by the ingenious adaptation of the Trunk Line system to local conditions by a special committee of the Southern Railway and Steamship Association in 1880. Report of meeting, August 12, 1880, in Proceedings, vol. vii.

[2] The report and opinion is reprinted in full by the Elkins Committee, 1905, as Appendix H.

ducers wish to enjoy the advantages of nearness to the market to the fullest degree. Study of the evolution of rate sheets clearly shows how such grouping of charges over long distances may be in the nature of a compromise to avoid actual violation of the long and short haul principle. Oftentimes places scattered along over a hundred miles of railroad enjoy absolute equality of charges. Obviously, the ton-mile rate steadily falls within such a group with progressive remoteness. Yet it is an inevitable feature of tariff building.[1] It is the kernel of the admirable Trunk Line rate system. Such an equalization of rates between points unequally distant from a given center, not infrequently arises in connection with mere competition of transportation routes. Referring back to the diagrams on page 474, it may happen that a complainant at X, the nearer point, recognizing the inevitableness of a low rate at Y, may succeed in securing an agreement that, while its charges cannot be less than at Y, at least they shall not be more. This was all that was asked in the "rare and peculiar" case of Youngstown, Ohio. But it is apparent that such a solution differs only in degree from those previously discussed. The question of principle remains the same. The roundabout route to New York up back by way of Youngstown could continue to compete at Pittsburg for as low a rate as on direct shipments, even if it observed the long and short haul principle to which the Pennsylvania direct route was committed, only by charging much lower rates per ton-mile on Pittsburg traffic through Youngstown than was levied on business there originating. This raises precisely the same question of distribution of joint expenses between local and competitive traffic, already discussed. In certain contingencies under

[1] See a series of articles by the present writer, in the Railway Age-Gazette, May and June, 1909.

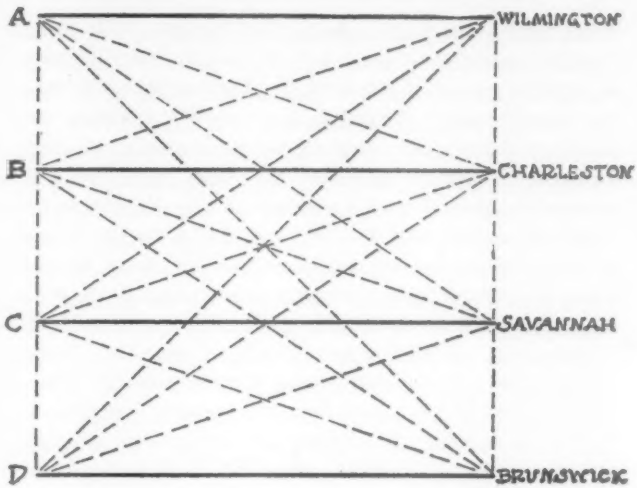
the second variety of the oyster cases, such a solution might apply. Would Chattanooga, for example, assuming it to belong in the second class, be contented with an equality of through rates with Nashville, leaving its local rates out to smaller towns as they are?

The most extreme instance of uniform or postage-stamp rates applied over long distances occurs in the transcontinental tariffs from different points in the East. These differ radically from the adjustment of rates between different points on the Pacific slope, already described. At the far western end the lowest rates are accorded to coast cities, because of water competition by sea. Rates to interior points progressively rise by the addition of locals inward toward the interior. The rates thus compelled by water competition are accepted by the all-rail lines. Thus the Pacific coast end is practically built upon a basing line. It might be expected that in consequence of water competition a similar system would prevail at the eastern end of the line; that rates to the Pacific coast from interior eastern cities would rise progressively according to distance inland, until at all events the direct all-rail charge became as low as by the combined rail-and-water rates. But such is not the case, and for two reasons. The first is that in the East interior cities are large and powerful factors in trade. There were no such interior cities in the Far West, until Spokane came into its own. These inland eastern cities, Pittsburg, for example, demanded equality of opportunity with the seaboard cities in Pacific coast trade. They succeeded in obtaining it by a grant of as low rates as New York or Boston enjoyed. In the second place, all the Pacific coast carriers enjoy a monopoly as far east as the Missouri River. But east of that line there are many routes interested in Middle Western cities, but having no interest in those in the East. They, too, have insisted upon giving their clients in such

places as St. Louis and Chicago as low rates as Philadelphia or New York. Little by little the equality of rates was extended until for many years a blanket rate covers the entire United States east of the Mississippi River.

Does not this constitute local discrimination against the middle western cities? This was one of the main contentions in the St. Louis Business Men's League case. Being one thousand miles nearer San Francisco, it demanded recognition of that fact in its tariffs. The difficulty is accentuated when both eastern and western point rates are considered together. St. Louis enjoys no lower rate than New York, altho one thousand miles further east; and inland points in the Rocky Mountain area may be one thousand miles further east than San Francisco and yet pay a higher rate. Thus it is possible to lop off one thousand miles at each end of the line without affording any recognition of it in the tariffs. The situation is too involved to discuss in detail in this place; but one finds it difficult to avoid the conclusion that the whole system will demand revision before long. Geographical conditions are immutable. Trade conditions are not. Perhaps it was inevitable that the former should by force of circumstances have been somewhat overlooked during a period of rapid growth. But, as commercial affairs approach a condition of stability and permanence, the matter will call for most careful examination.

Constant rates applied over long distances on the *same* line almost inevitably tend to pass over into a system of equality of rates over *different* lines. The necessity was evident enough in the Milk Rate case. This phase of the matter may theoretically best be discussed by reference to the following diagram. Suppose A, B, C, and D to represent any four inland "common points." It remains to show how it comes about that they all finally enjoy



equal rates to all four seaports, regardless of location. Each appears to be naturally tributary to some one of the seaports by a dominant or short-line route. In each instance this route properly rules the rate. Moreover, the four seaports may be considered for traffic purposes as equally and interchangeably distant from one another without regard to location. This follows from the fact that, except in extreme instances, rates by water do not vary according to distance, so small is the cost of mere propulsion by comparison with the terminal costs. In other words, the rate is the same from Wilmington to Brunswick or Savannah as to its next neighbor, Charleston. From this it follows, further, that Wilmington, Savannah, and Brunswick can all reach B—the point to which Charleston is nearest—on even terms. They may each have a direct line to B; but, as compared with a possible combined low water rate to Charleston and a low direct rail rate inland to B, the Charleston

route may be at least able to hold its own. All three outside competitors, then, are on even terms with one another in respect of access to B. But how does Charleston stand towards B as against the field? We have already concluded that a roundabout route must be allowed to meet, tho not to undercut, the ruling rate. Such a roundabout route from Wilmington on this diagram to its own natural tributary A could be, and as a matter of fact is, made by passing around by way of Charleston or any other seaport. Charleston wishes to share in this trade at A, and may reach it by similar tactics. It stands towards A precisely as Wilmington stands towards B. They finally agree to enjoy both A and B on even terms. But, as we have already seen, the admission of Wilmington to B is equivalent to the admission of all the rest. Whence it comes about that all four establish B as a "common point." And of course the same procedure fixes all the others, A, C, and D in the same way. In the Savannah Fertilizer case [1] it appeared that there were no fewer than 148 points in ten States from Louisiana to Kentucky, to which rates on fertilizers were absolutely the same from each of the four seaports. The degree of local discrimination of course was negligible at the remoter places; but it augmented in proportion as the immediate neighborhood of each seaport was approached. The apparent anomaly was greatest in a north and south direction along the seacoast. Thus Dinsmore, Florida, was 275 miles from Charleston and only 160 miles from Savannah, yet the rates from both points were the same. The governing feature usually was the entire equality of coastwise water rates, regardless of distance, which in turn compelled the land lines to follow suit.

The Cincinnati Freight Bureau case, otherwise known as the Maximum Freight Rate case,[2] affords the best ex-

[1] Ripley, Railway Problems, pp. 286–308.

[2] Decided in 1894. Reprinted in Ripley, Railway Problems, pp. 145–190.

ample of the difficulty in practise of adjusting rates over different and widely separated lines on a distance basis, in order to satisfy the demands of commercial competition. Atlanta, Georgia, the key to the Southern market, is 876 miles by rail from New York, but only 475 miles from Cincinnati and 733 miles from Chicago. In other words, Cincinnati is 54 per cent. as far from Atlanta as is New York; and even Chicago is only 84 per cent. as remote. In general, this valuable Southern territory, on the basis of mere distance, is really nearer to the leading Middle Western cities than to those on the Atlantic seaboard. Yet this geographical situation is not reflected in the railway tariffs. Rates from the West, especially on manufactures, were much higher, always relatively and often absolutely. Thus first-class goods in 1894 paid $1.47 per hundred from Chicago (733 miles), while from New York (876 miles) the rate was only $1.14. At points like Chattanooga the disparity was even greater. This city is only 595 miles from Chicago as against 1,060 miles from Boston. Yet the rates were actually lower ($1.14) from New England than from Chicago ($1.16). The principal reason for this of course was the cheap coastwise water competition by way of Charleston and Savannah. The Eastern all-rail routes could charge no more than the combined rail-and-water lines. The difference in relative cost of operation by water was recognized by means of so-called "constructive mileage." From New York to Savannah by sea is about 750 miles; yet the allowance to the steamers was proportioned upon a distance of only 250 miles. Water cost was thus fixed by comparison with rail cost in the proportion of one to three. Yet, even with this allowance in favor of Eastern cities, New York remained more distant from Atlanta than Cincinnati; the "rate-making" distance from the former being 538 miles as against only 475 miles from

Cincinnati. The arbitrary reduction of the New York distance left Chicago more remote (733 miles), but not in so great degree as its tariffs implied. These tariffs were also peculiar in another regard. The handicap against the Western cities was much higher in respect of manufactures and high-class freight than upon foodstuffs and raw produce. This in turn was clearly due to a long-established agreement between the lines east and west of the Alleghanies, as to a division of the field. Originally each set of lines was harassed by roundabout competition from the other. Western foodstuffs and raw produce were reaching the South by way of the Atlantic seaboard; and Eastern manufactures from New York, for instance, were rambling about over Western lines in order to reach places like Atlanta and Augusta, naturally served by direct routes from the East. The agreement to divide the field, dating from 1878, steadily became more irksome, however, to the West, with the development of manufactures of its own. The problems raised by this change are too large to be considered here. The main question for the present inquiry is as to the relative fairness of rates from two widely separated centers to a common market, those rates not being proportioned to distance.

The final settlement of this knotty question is suggestive of the extreme difficulty of attempting to apply mileage or distance rates over different railroads too rigidly. The complaint being as to relativity, there were only two possible solutions.[1] One was to increase the Eastern rates, the other to order a reduction of the charges from the West. The former course was impossible, owing to the presence of water competition by sea, not under control. The latter alternative was, therefore, chosen by the Interstate Commerce Commission in its de-

[1] *Cf.* testimony in Elkins Committee Report, 1905, p. 2726.

cision in 1894. The rates from Western cities were always composed of two parts. The charge from the Ohio south was kept distinct as a local rate. The other portion of the rate applied from Chicago, for example, down to the Ohio River. Of these two parts, the Trunk Line portion appeared reasonable enough. It was the Southern local, often 100 per cent. higher than the other, which seemed most unreasonable; and which, according to all appearances, had been used to bring about a closure of the market to Western manufactured goods. Consequently the Commission ordered a reduction of the Southern local rates, cutting them drastically, but leaving the Northern locals unchanged. This decision was never carried into effect; as the Supreme Court of the United States held the Commission to have no such rate-making power. Nothing was done apparently to remedy the disparity in charges against the West, altho the railroads serving that territory urgently pressed for action. Every time they threatened a reduction of their Western rates, the Eastern lines came down in proportion. This left the relative rates as before, altho the general scale would be lower all round.

At last, in 1905, the Eastern lines from Baltimore south agreed to permit a reduction of 5 cents in the rates from Western cities by lines *north* of the Ohio River; but they refused to accede to any change in the rates from the Ohio south. This was the exact opposite of the Interstate Commerce Commission's proposition, altho both plans were intended to compass the same object; namely, to place Western shippers more nearly on a parity with the East. The Commission, in 1894, laid all reduction upon the Southern portion of the rate; the railroads, in 1905, placed it all upon the Northern part. This obviously afforded no relief to the original complainant, Cincinnati. In fact, it actually operated to its

great disadvantage, inasmuch as it let its two powerful rivals, Chicago and St. Louis, into the Southern field on distinctly more favorable terms. Such was the outcome as a result of the friction of railroad competition. The reasonableness of some reduction was clear. But to the layman, the fairness of laying the reduction entirely upon the northern locals, already relatively low, instead of upon the extremely high Southern part of the rate is not by any means so clear.

One further detail of this adjustment of Southern rates raises a question:—

> Rates between Richmond, Virginia, and Atlanta, Georgia, are less than the rates between Richmond, Virginia, and Greenwood, South Carolina (an intermediate point). This is due to indirect competition between Richmond and Western jobbing points; and in order to permit the jobber or manufacturer in Richmond to do business as against his competitor in Cincinnati, it has been necessary to fix the rates from Richmond to Atlanta with some reference to the rates from Cincinnati to Atlanta. At Greenwood, South Carolina, we find that the Cincinnati shipper pays a very much higher rate than to Atlanta, and that the rates from Richmond are already sufficiently low to enable the Richmond shipper to compete at Greenwood with the Cincinnati shipper.[1]

Is this not in a measure described in the passage, "unto every one that hath shall be given; but from him that hath not, shall be taken away even that which he hath"? This railway argument contains dangerous possibilities. In effect, upon the theory of charging what the traffic will bear, it means that a railway (in this case the Seaboard Air Line) may increase its own local rates, not in proportion to the length of its own haul (from Richmond to Greenwood), but according to the remoteness of that local point from another competing market. The inevitable

[1] Elkins Committee Report, 1905, Digest, Appendix III., p. 231.

effect of the general adoption of such a policy must be to erect arbitrary barriers to the free and wide-spread movement of commerce. The great advantage of the flat rate or of commodity rates is that, placing all competing centers upon an absolute parity irrespective of distance, they encourage the utmost freedom of trade.

Certain general conclusions seem to be warranted by the analysis of these cases of local discrimination. The first is that they all show the extreme delicacy of commercial adjustment and the existence of conditions well beyond the control of the carriers, jointly or singly. Trade jealousies in particular—the rivalry of producing and consuming centers—render relativity of rates of paramount importance to shippers. This class in the community is interested comparatively little in the absolute level of rates, that being more directly the concern of the general consuming public. To the public, as represented by State and Federal legislatures, it is difficult to make these complicated matters of commercial competition clear. The only basis of rate making that is easily understood is one founded in general upon the distance principle, or, in other words, correlated with considerations of cost of operation. Any departure from this basis is apt to breed suspicion, and at all events puts the carrier upon the defence. It is bad policy, in their own interest, for railroads to permit a continuance of such violations of the distance principle in their general tariffs (commodity rates as a special resource to meet the special needs of commercial competition may be set aside), except in extreme cases. This was recognized by the Trunk Lines when they almost unanimously acquiesced in the long and short haul provisions of the Act of 1887. The people of the United States have the same right that they had then, to expect that at the earliest possible moment the wise provisions

of the Trunk Line rate adjustment shall be widely accepted in the West and South. Whether those regions, and the railways that reach them, have yet sufficiently developed to warrant the change is a matter requiring careful consideration in detail.

The necessity of some exercise of governmental control over these carriers of the country, in order to mitigate, if not to eliminate, local discrimination as far as possible, is evident. Many of the instances previously cited have clearly shown how impossible it often is for any railroad, single-handed, to deal with an involved situation in a large way. Take the Cincinnati Freight Bureau case, for instance. Conceding, as many would, the claim of Western cities to some readjustment of tariffs in their favor, is it not an anomaly that the lines south from Baltimore, several hundred miles away, should finally dictate the means to be employed to remedy the situation at Cincinnati and Chicago? Who else but the Federal government could ever hope to disentangle the almost hopeless snarl of competition involved in the controversy over differentials to and from the Atlantic seaboard? This controversy is at bottom one of local discrimination. And yet how is the Interstate Commerce Commission to aid in the solution of these intricate problems under present conditions? Its hands are tied in two ways. It cannot prescribe minimum rates, and the long and short haul clause remains as much a dead letter since the Alabama Midland decision as it was before the recent revision by the Act of 1906. True, the Commission may, in some cases, accomplish by indirection its purpose of establishing a proper relativity between rates through the exercise of its newly granted power to fix maximum rates. This was done in the recent Spokane and Denver decisions. Holding that the charges at interior points were out of line with through rates to the Pacific coast, and being

unable to govern the long-distance tariffs, it simply ordered a reduction of certain rates at Spokane and Denver as inherently unreasonable. This solution is not, however, always practicable. Not infrequently the lower rate at the remoter point will drop as soon as the intermediate rate is lowered. Thus the former relativity of charges is re-established on a generally lower scale. The complaint in the Eau Claire lumber case[1] required the exercise of such power over minimum rates, in order to remove the disability against a particular center. And then, finally, it is indubitable that commercial competition as a "compelling" factor has been somewhat over-emphasized by the railroads. Too often conditions in part brought about by themselves, or in which at least they have acquiesced, have been set up as a defence for rates favoring certain points. This is especially true of the Southern basing-point cases. Whether any further grant of powers to the Interstate Commerce Commission by Congress is necessary at this time in order to enable progress to be made in this connection, it is as yet too soon to predict. The course of affairs for the next few years will at all events bear attentive watching by all students of transportation.

W. Z. RIPLEY.

HARVARD UNIVERSITY.

[1] Ripley, Railway Problems, p. 214.

SOCIALISM AND THE CLASS WAR.

SUMMARY.

The doctrine of a class-war proclaimed by American Marxists, 512.—No class divisions or class struggles in the United States, 513.—Social reconstruction not dependent on a socialist party, 518.—How political and economic reforms are achieved, 520.—The evils of society are to be reformed separately, 525.

THE economists have stated the essence of socialism to be—in the language of John Stuart Mill—"the joint ownership by all the members of the community of the instruments and means of production, which carries with it the consequence that the division of all the produce among the body of owners must be a public act performed according to rules laid down by the community."[1] As Schaeffle put it, "The Alpha and Omega of Socialism is the transformation of private and competing capital into a united, collective capital."[2] To this, however, the American Socialist party, acclaiming Karl Marx as its prophet, adds a doctrine of the "Class War" upon which it lays so much stress as to challenge its examination in the light of American conditions. "The struggle for mastery," says a writer in a text-book which is recommended by the Socialist party leaders, "is necessarily a class struggle, a struggle between the proprietary and the non-proprietary class. The interests between these two classes being diametrically opposed, a class struggle is inevitable. Nothing is so important as to keep clear the class character of the movement. When a laborer

[1] Fortnightly Review, April, 1869.

[2] The Quintessence of Socialism, p. 20. The Fabians say much the same. Their manifesto declares that "our aim, one and all, is to obtain for the whole community complete ownership and control of the means of transport, the means of manufacture, the mines and the land."

realizes that he can only permanently improve his condition by improving the condition of his class, and realizes what his class interests are and how they can be advanced, he is said to be class-conscious. When he becomes class-conscious, he recognizes the class struggle and takes his stand with the class of which he is a member. A recognition of this fact of class antagonisms on the part of the whole working class and a united political action would enable them to master the public powers and put an end to capitalistic exploitation."[1]

Two assumptions in this typical statement deserve examination:—

(1) That society is divided into two classes, between which, in the words of the New York State platform for 1907, "there can be no common interest or harmony."

(2) That "united political action" must be taken by one of these classes which will "enable them to master public powers," before society can expect to "put an end to capitalistic exploitation."

First, what are the facts about class distinctions and class-consciousness in America to-day? What feelings, prejudices, judgments, affect the assumption that "the struggle for mastery is necessarily a class struggle, a struggle between the proprietary and non-proprietary class"?

American society is divided not into two classes, but into scores of classes,—divided by economic interest, sentiment, temperament, training. Wage-earners, salary receivers, investors, are stratified like thin-bedded rocks in multiple layers. The engineer receiving $150 a month is separated as definitely from the Italian section-hand by a feeling of class pride and vested interest in his high pay as the president of the road is separated from the engineer. Engineer at $150 a month and president at

[1] Modern Socialism, by Charles H. Vail, p. 164.

$50,000 a year may conceivably each be earning more than his pay for the road he serves; but each would refuse to strike to aid the other, and both have a "class-consciousness" that excludes from their fellowship the section-hand quite as much as the capitalist stockholder. The independent farmer, whose gains are little more than wages for his toil, has less affinity with his fellow capitalists who own coal mines than with the harvest-hand whom he hires to get in the crops. The white carpenter or brick-layer shows more class prejudice against the negro teamster than the Jewish banker against his compatriot tailor. The shop-girl feels herself as superior to the domestic servant as the servant's mistress feels herself superior to the shop-girl. The workman who owns house and lot, to that extent a capitalist, will defend his 'ewe lamb' as stoutly against the *sans culottes* as an Astor will defend his regal rent-roll against the workman. Trade-union presidents accompany newspaper proprietors before congressional committees to seek the destruction of the paper trust, while employees of the trust are eager for its continuance. Railroad trade unions even protest against government regulation of rates. Russian immigrants, solicitous to keep the door open for their compatriots, tearfully protest when organized labor proposes to strengthen its own position by restraining immigration. Retail tobacconists have shown as strong hostility to the tobacco trust as ever did striking factory hand against "tyrant capitalist"; independent refiners have fought the Standard Oil Company as bitterly as the Homestead strikers fought the Carnegie Steel Company; while miners have deported negroes and Chinese from gold camps as remorselessly as enraged mine owners deported rebellious strikers. In Colorado, where shooting is not infrequent in labor disputes, a government agent, while investigating the theft of public coal lands, was also shot.

"All these antagonisms, vividly present as they are in our society, expressive of the judgment of citizens on their interests, are based upon a delusion," say the believers in the Class War. "The warring elements are ignorant of the scientific basis of capitalist society, and we expect to convince them that in reality every man belongs to one of two camps, the camp of the propertied or the camp of the propertyless. We shall unite the propertyless into one army, with one common purpose, animated by one common impulse, the overthrow of the ever diminishing but powerful army of capitalists."

Such a task must be fraught with difficulties, because, first, a large part of our citizens have interests in the two armies both as exploiters and as workers, and, second, it is hardly possible to wipe out the class prejudices depending on race, color, occupation, and sentiment.

An increasing number of Americans own some property, —very little perhaps, but enough to give them an interest as small capitalists. Farmers own their homesteads, wage-earners have money in the savings-banks, foremen and superintendents hold stock, a million people own railroad bonds and shares, small shopkeepers cling to their little heap of goods. Around every big city the long streets of spacious houses are occupied by professional men and salaried employees who possibly produce for their employers more than they are paid, but who in turn keep servants, engage wage-earners, and are eager for dividends on their scattered investments. It is idle to argue that these classes are doomed to extinction, that the march of events will in some distant day force them wholly among the propertied or wholly among the propertyless. They show a stubborn vitality: they increase in numbers yearly.

Occasionally the struggle between organized labor and associated capital become so acute that a "war"

between them is waged, as in Colorado, Idaho, San Francisco; and the Marxian doctrine seems to be illustrated. Even in these most violent outbreaks, however, the struggle was not between all the propertied and all the propertyless, but only between sections of each side. Had the working folk of Colorado been one with the Western Federation of Miners, Mr. Haywood, its secretary, instead of receiving only a negligible vote, must have been elected governor. Had the business men of San Francisco been solid against Schmidt, the labor mayor, he could hardly have increased his vote in the respectable residential quarter at the second election.[1] In San Francisco the "labor" administration was used by corrupt business exactly as a "business" administration is used by corrupt business. In the heat of the first campaign, immediately after a disorderly and routed strike, passion may have welded most of the labor interests on the one side, most of the business interests on the other side. But Ruef, the convicted organizer of labor's forces, was a "business" lawyer, the incarnation of bad "business" principles; and Taylor, the man finally chosen by business to rehabilitate the city, was not a business man, but a scholar and (oddly enough) both a lawyer and a physician.

It is undeniable that an actual conflict over wages and conditions of labor, a conflict with truces and treaties, but no disarmament, is being waged between employers and employees in many standard industries. But the opposing forces include only a fraction of the people. Of the twenty-four millions engaged in industry, but eleven millions are capitalists or wage-earners, the remainder being farmers, tenants, professional, commercial, and agent classes. Even of these Professor John R. Commons calculates that "not more than six million

[1] See "The Mote and the Beam," by Lincoln Steffens, American Magazine, November, 1907.

wage-earners and one and a half million employers" are in actual conflict.[1] Their importance is out of proportion to their numbers because they operate fundamental industries, such as railways and coal mines, and command strategic industrial points. To magnify them into the whole nation and base the expectation of a better social order solely upon the victory of the side numerically strongest is to ignore the great public which is beginning to assert its right to hold the balance between these two struggling classes.

Doubtless, in judging the merits of any skirmish in our many class wars, outsiders, from wage-earners who strike in sympathy when they have no quarrel of their own to judges who declare labor laws unconstitutional, are influenced by their association with one or other of the antagonists, by their education, social affiliations, and material interests, exactly as they are in judging the merits of a money controversy, a negro uprising, or an international broil. But that human weakness does not constitute them combatants nor divide all society into just two hostile camps.

In the presidential campaign of 1896 creditor and debtor were supposed to be natural antagonists. That was an approximation to a "class war," with the Haves fighting to keep and the Have-nots fighting to get. To oppose free silver was to endanger one's life in Nevada, to support free silver was to endanger one's employment in New York. But wage-earners without bank-books marched by thousands under the gold standard in the East and capitalists subscribed to the silver campaign in the West. Inheritance tax, railroad ownership, changes of the money system, may evoke similar passions again; but each side will be a conglomerate of many classes, a cross-section of the whole democracy.

[1] See Proceedings of the American Sociological Society at the meeting of December, 1907.

The second assumption growing out of the doctrine of the class war is that social reconstruction is conditional upon forming a Socialist party completely independent of all other parties, upon devoting all energies to fostering its growth, upon keeping it clear of contamination with the bourgeoisie, and declining electoral alliance under any conditions with any other parties. "The first step," says Mr. A. M. Simons, ex-editor of the International Socialist Review, "must be political union of the farmers and wage-workers for the purpose of electing their class into power. When this is done, they will have control of their own government and can enact measures in their own interests."[1] Absolute isolation, the obligation upon all party members to vote the full party ticket on all occasions, expulsion of any who support at election any non-party candidate,—this is the method adopted to insure fidelity to the doctrine of the "Class War." Unlike the Democratic and Republican parties, the Socialist party makes unmarred allegiance to the ticket a *sine qua non* of membership. In joining, one must forswear the right of private judgment as to electoral tickets and renounce independence in politics. For one of its members to support Folk, La Follette, Roosevelt, Johnson, or Hughes is counted treason. No measure can be of value unless it is passed by an avowedly Socialist legislature, say they. "The first step must be the organization of the farmers and wage workmen into a political party for the purpose of gaining control of the powers of government. Until this is done and the government is actually in the control of the producers, the farmers and wage-workers are *little interested in governmental actions*. Once the government is so controlled, once, in short, the Socialists are in power (and they can scarcely be expected to accomplish much before),—they

[1] The American Farmer, p. 174.

can use that government, state, national, or local, in the interest of the creators of wealth. For the first time in history there will be an opportunity for an intelligent choice as to the measures most desirable for the common good."[1]

This method of political action assumes that the negro cotton picker in Louisiana, the Polish coal miner in Pennsylvania, the French-Canadian cotton spinner in Massachusetts, and the Italian section-hand in Dakota have interests so identical with the interests of the Irish brick-layer in New York, the Yankee printers, machinists, carpenters, and plumbers all over the country, and the farmers of the West and Middle West, that, inspired by a class fervor, they will all join hands, and, sinking the various differences about color, customs, skill, and wages, which to the ordinary observer widely separate them, they will unite in one political party, and, invincible by their numbers, will fight their Armageddon against their sole enemy, the capitalist class. In the mean time all the middle classes—people with small savings, small land holdings, or large professional incomes—will have disappeared. Therefore, the victorious proletariat, agreeing spontaneously upon the principles of social organization and income distribution, will straightway establish a socialized commonwealth. The political activities of the Socialist party are confined to recruiting the army with which to fight this battle. "The Socialist party does not pretend to stand for all the people. It honestly claims to stand for the working class against the capitalist class."[2] One section of the party so far modifies its attitude as to admit that, when any Socialist representatives are elected, they may, without disloyalty, vote for Socialist measures proposed by other parties,

[1] The American Farmer, by A. M. Simons.

[2] Article on "The Socialist Party, its Aims and Methods," The Worker, October 12, 1907.

exactly as the French Socialist deputies voted for an income tax, the German Socialists for workingmen's insurance laws, and the English Socialists for old age pensions. But, pending the election of their own members, all of them "are little interested in governmental activities," until they control the government and are in power, "they can scarcely be expected to accomplish much."

Examination of the actual method of achieving political and social reforms in America indicates that this system of separatist political action, even so far as it is possible, is unlikely to be fruitful. It can create groups of malcontents who may carry on a destructive, guerilla warfare, but it is obstructive to the opening of an opportunity for an intelligent choice as to the measures most desirable for the common good.

The American method of getting things done politically is different from the European method. Across the Atlantic responsible governments draft laws, and with their majorities enact them, usually, as to great issues, after an election has been fought on them. Each legislative body has its recognized leader with its party cabinet, and general measures are proposed, fought over in the constituencies, and finally passed by party votes. The Trades Disputes' Act and the Education Act, the chief proposals of the government of Sir Henry Campbell-Bannerman in 1906, were discussed at a Parliamentary election, and the decision of the electors upon them was shown in the composition of the Parliament elected. In France the question of church disestablishment was fought out at various elections, and the composition of the Chamber of Deputies reflects the judgment of the electors upon it. In Germany an appeal was made by the emperor to the country upon the appropriations for the navy and for the colonies, and the Reichstag shows in its composition the country's decision.

But in America the method is different, particularly in the State governments. Both parties put into their platforms declarations in support of measures supposed to be popular, "weasel words" being used frequently to suck the meaning of the vital words, and so save alienating the opponents of the measures. The really vital plank of every platform is never written. It is, "Give to our party the spoils of office." Neither Democrats nor Republicans hold views for which they would sacrifice office concerning such matters as child labor, inheritance tax, eight-hour day, public ownership of monopolies, taxation of unearned increment in cities, public irrigation works with public ownership of the ditches and of the land reclaimed. One party is as likely as another to favor them.

Further, in state and city, laws are frequently not drawn and pressed to passage by the legislators. The elected persons are often only registering machines. Groups outside the State House prepare the measures, argue them before committees and can force them through by organizing public opinion in their favor. The elect, not the elected, rule. As Mr. James Bryce wrote: "Nothing is more remarkable about State legislators than their timidity. No one seems to think of having an opinion of his own. On burning questions—they are few and mostly personal—he goes with his party. On questions of general public policy he looks to see how the cat jumps, and is ready to vote for anything which the people or any active section of the people cry out for."

Professor A. Lawrence Lowell gives similar testimony. "In America at the present day," he says, "the issues do not make the parties." He examined the records of the divisions in sessions of the legislatures of New York, Massachusetts, Pennsylvania, Ohio, and Illinois, and found that "except in New York the proportion of party

votes was never more than 16 per cent. and in several cases it was less than 2 per cent. Moreover, a part of these votes were cast in the election of officers who have no possible connection with policies." "Party issues can in the nature of things," he continues, "cover only a small part of legislation," and "the members of most of the state legislatures are elected by parties who have comparatively little connection with the questions they are called upon to decide."[1]

This divorce between parties and policies, as Professor Lowell demonstrates, grows from that organization of government which the American constitution and democratic institutions foster. Any party in America which gains majorities controls not policies, but offices and salaries. If administrative officers were all placed under civil service rules and legislators were unpaid, then running for office would not be running for a salary; but, so long as abundant spoils make the party boss, whether Republican, Democrat, Populist, or Socialist, in Lowell's phrase, "an office broker," citizens interested in a reconstruction of society through legislative action can secure measures, not by waiting until "they elect their class into power," but by framing bills which, if they commend themselves to public opinion, salary-takers must pass and administer.

Already far-reaching measures have been enacted by this method. For example, child labor laws, among the most drastic in the world, have been passed in New York by the following illogical plan. First, supporters of such laws voted for Republicans and Democrats without regard to their opinions on the child labor question, without even educating the candidates by trying to pledge them. Then a committee made investigations, drew model laws, and elaborated briefs in their support.

[1] The Government of England, by A. Lawrence Lowell, vol. ii., chap. 35, pp. 91–93.

Newspapers were supplied with "copy," and, since the laws were not a party issue, the editors were free to give their support. Delegations of citizens called upon legislators, and swarmed in committee rooms at Albany to announce their support of the bills and to narrate the facts about the horrors of child employment. Of course, the opponents also appeared at the capitol and also "worked" the press. Then the legislators, awakening to discover that child labor was an urgent issue, tried to find the line of least resistance. A few had convictions, the majority waited to be told what to think. Letters, telegrams, deputations, poured in, the most telling stroke being the interviewing of legislators by insistent committees in their home districts at week-ends when they were seeking repose and seclusion. In proportion as the legislators found that a vote against the laws would set loose excited opponents to their own re-election, their convictions were formed and confirmed. Finally, a majority supported the first laws in 1904, and each subsequent year amendments have been passed by similar means.

A group of less than a dozen men, in two years, secured the adoption of the Australian form of ballot in Massachusetts. By analogous methods most varied measures—some of them found among the "immediate demands" of Socialist platforms, ballot reform, referendum and initiative, factory laws, franchise extensions, civil service rules, limitation of working hours for women, eight-hour laws for miners—have been put on the statute books in different States.

In federal elections for President and for the House of Representatives, issues are somewhat more prominent, tho members of the House usually gain greater popularity in their constituencies by securing appropriations for their districts for new post-offices, rivers and harbors, than for their advocacy of specific reforms. The members of the

Senate, being chosen by State legislatures, naturally represent, as a rule, the interests most powerful in the dominant political party, tho in the States that have evaded the Constitution by voting on the election of the United States senators at party primaries and making the result binding upon the State legislature the political opinions of the candidates influence the choice.

In Congress, as in the States, the actual passage of laws depends more upon the pressure of public opinion subsequent to election than upon the reflection of that opinion in the party color of those elected. The Reclamation Act, one of the greatest pieces of constructive legislation ever enacted, was passed as a non-partisan measure, as was also the Panama Canal Act. President Roosevelt's favorite measures of 1906–07, the Pure Food Law and that amending the Interstate Commerce Act, were passed with the help of Democrats. He was elected in 1904 because in general the voters indorsed his policies; but so illogical was the composition of the legislature that his own party would have rejected the measures he was apparently elected to forward.

A further reason for doubting the possibility of creating in America a single party informed by one motive and ruled by one disciplinary code is that in the different States political conditions are as various as the physical climate. America is not a country; it is a continent. No more can uniform lines of political action be laid down than they could for England, France, Spain, Italy, and Russia. In Texas, where hundreds of thousands of homesteaders are raising their first crops, each man working for himself, and in Washington, Oregon, and the Dakotas, where vast wheat areas and unrivalled orchards pour riches into the laps of self-employing farmers, political problems will not center around the employer and conditions of employment, as they may in the factory States

of New England. While the cotton growers in Carolina are opposing the federal courts over the State's right to force the railways to reduce passenger and freight rates, Oklahoma may be fighting to establish a State oil refinery in antagonism to the Standard Oil Company, Idaho demanding federal construction of irrigation works, and Massachusetts debating the purchase of the Boston & Albany line.

Circumstances will determine, inevitably, through what organizations the advocates of the respective measures operate. In one city they may organize an independent party for a city election, in another fuse with an opposition party. Here they may find a magnetic leader who will rejuvenate an old party, there they will antagonize all old parties. Now the workmen may advance a "walking delegate" as their standard bearer, again a "parlor Socialist" may carry their banner. Sometimes public opinion will weary, and presidential candidates be unanimously conservative. Again, the country will be in a fevered haste for change, and candidates all protest their radicalism. Political life is complex and variable. It can be embraced by no simple formula. Compromise, expediency, half-measures, have ever been its characteristics. "Class war"—fanatical, doctrinaire, unbending—might conceivably tear down an old civilization. It could never build a new civilization.

Clearly, then, contrary to the Marxian assumption, "the evils from which modern society suffers *are* . . . to be solved separately." Each reform included in the Socialist's own platform, if it come within the range of practical politics, will attract a fresh band of supporters and alienate some who rallied for previous reforms. It were idle to expect that even a considerable minority of a nation could understand the subtleties of Marxian doctrine, even if these subtleties were demonstrably true. A band of devoted

souls, well grounded in the reasons for their faith, may conceivably form a nucleus of a political movement. They may be the regulars enlisted for the whole war, but most of the regiments fighting for any measure consist of militia enlisted for a particular campaign.

Taxation of city land values, if ever accepted, is likely to be imposed with the help of business men and employers of labor, who, finding their rents rising, may possibly be more enthusiastic for land taxation than their own employees. An inheritance tax, graded so as to leave small fortunes almost exempt, while appropriating for the community the upper part of large fortunes, seems to appeal as strongly to the interest of the man of moderate means as to the scavenger and the hobo. Public ownership of the railways was made a political issue not by city slum dwellers, destitute of everything but muscle, but by farmer Populists, owners of their own homesteads. Trade unionists are as hostile to compulsory arbitration of labor disputes which the public, a great sufferer during a strike, is beginning to demand, as are their opponents, the associated employers. A system of trade schools, designed to make every man a skilled workman, will possibly be opposed by organized labor and supported by disinterested educationists and organized capital. Public health regulations, under which the state gives free service to individuals, receive more help from rich doctors than from penniless plebs. A Republican party, not void of capitalistic elements, was more active in establishing the National Forest Reserve, a great piece of collectivism, than either the American Federation of Labor or the Socialist party. Child labor committees are composed of every sort of person without regard to occupation or wealth. A factory owner in Connecticut, quite as much as his employees, has an interest in the retention of national ownership of the minerals under lands still in gov-

ernment possession, if cheaper coal will result. Merchants in New York and Buffalo were more eager for an enlarged ship canal from the lakes to New York, to be built and operated by the public, than were the propertyless crowds in those two cities. Labor colonies for unemployed wanderers are advocated by charity organization societies and railroad corporations.

Every step towards that co-operative commonwealth which Socialists agree is their goal must be proved advantageous to the nation before it will be taken, and the friends and foes of different steps will vary. It is a misguiding assumption that we are divided, here in America, into goats and sheep, with the sheep on the right hand of Karl Marx, and the goats on the left. Most human beings are quick, perhaps, to see the change which will serve their personal interest at the moment, hard to convince when the public good requires the sacrifice of that interest. The immediate material interest of any man, wage-earner or capitalist, might put him, however, on opposite sides at different times.

To sum up, the doctrine of the class war is untrue to many of the facts. If it were true, it would be irrelevant to the main issue which Socialists raise, the establishment of a co-operative commonwealth, and insistence upon it distracts attention from the only method of social reconstruction possible, while raising hopes of a furious transformation which, in the nature of the case, cannot be fulfilled.

JOHN MARTIN.

STAPLETON, S.I.,
NEW YORK.

COFFEE "VALORIZATION" IN BRAZIL.

To understand the coffee situation in Brazil, one must bear in mind the main features of the growth of the industry. For decades, coffee has been the chief export product, and has dominated the world market for that commodity. Three-quarters to four-fifths of the world's supply now comes from three States of this one country.

Rapidly increasing world demand,[1] a wonderfully fertile soil, and cheap labor[2] kept the industry in a flourishing condition down nearly to the close of the imperial régime in 1889. After the abolition of slavery and the establishment of the Republic, several factors contributed to prolong the prosperity. World demand continued to increase, virgin soil was still available, immigration supplied labor, and Brazilian currency was falling in gold value.[3] The inevitable happened. Easy profits led to increased investments and careless methods. Little effort was made to cultivate intensively. Hand labor in cultivating, picking, washing, drying, hulling, polishing, sorting, packing, loading, remained in vogue, and planters fell into a luxurious absenteeism in the capital or in Paris.

The time came, about the beginning of the new century, when conditions changed. Supply passed demand, formidable surplus stocks began to appear, prices, which had long been declining, fell to or below cost of production,[4] Brazilian

[1] For instance, consumption in the United States increased from 220,000 tons in 1880 to 245,000 in 1890 and 487,000 in 1907.

[2] Slavery was not abolished until 1886.

[3] The fluctuations of Brazilian exchange have been a noteworthy but often overlooked influence in the coffee industry. The crop is chiefly sold abroad. It is paid for in gold equivalents, while the expenditures of the planter are in milreis. Falling exchange gives the planter increasing returns in milreis, while cost of living, and consequently wages, remain unchanged or rise but slowly. This was the condition from 1890 to 1900, and in spite of declining prices of coffee the industry continued to prosper, and the planter to live in a fool's paradise.

[4] The cost of production of coffee delivered in New York, in 1906, was estimated at $16.36 per bag. The market price was about $10.

exchange reached bottom and began to rise rapidly.[1] The conditions of the nineties were reversed, and planters began to turn to the banks for aid. A few far-seeing ones realized that the real remedy lay in the introduction of methods which should reduce the absurdly high cost of production, but they were unable to turn the tide. When bank assistance failed, demand was made for artificial checking of supply, and the government prohibited further planting. But results were small. The law was evaded to some extent; but, even if obeyed, it would have failed, for the improved methods employed by the few saner planters, and the coming to maturity of trees set out during the preceding decade, continued to augment the crops.

The three coffee States have long been the chief economic and political centres of Brazil. Especially is this true of São Paulo, and São Paulo was the chief sufferer in the coffee crisis. Coffee-raising is almost its sole industry.[2] Conditions demanded either reform in methods of production, with bankruptcy for the weaker planters, or further government assistance. The latter was the easier solution, and it was a political possibility. Soberer views might still have prevailed but for a new danger—the "bumper" crop of 1906–07. Brazilian production had risen slowly from 9,500,000 bags in 1899–1900 to 11,300,000 bags in 1905–06. Then it suddenly jumped to 20,000,000 at a time when there was already a surplus stock on the market of some 4,000,000 bags. Small wonder that the warnings of the wiser minority were unheeded, and that the coffee States, led by São Paulo, launched their valorization plan.

By this plan the States of São Paulo, Minas Geraes, and Rio de Janeiro agreed to purchase and hold for better prices enough coffee to keep out of the market all but a quantity sufficient to supply the world demand, which was estimated

[1] In 1899 the milreis was worth less than 6*d.*: in 1905 it passed 17*d.* Since then there has been some decline, and it is now somewhat above 15*d.* The government has adopted a "Conversion Law" which now prevents its falling below 15*d.*

[2] São Paulo produces 60 per cent. of the total Brazilian crop, and this one commodity constitutes over 98 per cent. of the State's exports.

at 17,000,000 bags. Feeling that Brazil held a virtual monopoly of the trade, the advocates of the scheme maintained that this withdrawal of excess supply would at once force prices up to the minimum fixed by the governments as the basis for their purchases or subsequent sales. This price was to be from 32 to 35 milreis per bag[1] for Santos grade No. 7, with other grades in proportion. It was determined by an estimate of "reasonable profit" at existing cost of production.

Funds for the purchase were to be raised by a £15,000,000 loan on the credit of the States. Interest, amortization, and other charges were to be provided for by a surtax on coffee exports of 3 francs per bag.

Difficulties immediately appeared. Capital was loath to back the scheme, and the loan could not be placed without federal guarantee, and this the federal government declined to give. São Paulo's two co-operating States grew timid and withdrew. The plan must be abandoned or São Paulo must act alone.

This the State decided to do. It began operations by the issue of treasury bills for £1,000,000.[2] With the proceeds it purchased coffee and used this as the basis for loans the service of which was to be met by the surtax of 3 francs per bag. Rio de Janeiro and Minas Geraes supported the plan to the extent of imposing a similar tax, but they apparently took no part in the coffee purchases.

São Paulo also succeeded in placing loans of £1,000,000 with the Brasilianische Bank für Deutschland (soon afterwards redeemed, however), £3,000,000 with the federal government, and later £3,000,000 with Schroeder & Co. of London, and the National City Bank of New York.[3]

By the end of 1907 São Paulo had borrowed some $88,400,000, and had purchased, at rates about $1.22 per

[1] To be raised gradually, in subsequent years, to 40 milreis.

[2] 16,060,422 milreis.

[3] Of the total loans, £3,200,000 is said to have been supplied by ten large coffee houses of Europe and the United States. See London Economist, August 22, 1908.

bag (of 132 pounds) above the market price, 8,357,500 bags of coffee.[1] But prices failed to rise. In fact, they fell slightly. The existence of the huge government stock induced conservation among dealers. Possibly, too, there were thrown on the market stocks which had been previously hoarded in anticipation of valorization.[2] The proceeds of the surtax [3] were insufficient to provide safely for interest, storage, commissions, amortization, etc. Attempts to dispose of portions of government holdings threatened further to demoralize the market. Creditors grew nervous and began to demand their money. São Paulo found itself unable to raise further funds on coffee collateral. Purchases had to be suspended, and valorization may be said to have come to an end by the beginning of 1908.

The results of the experiment were yet to be faced, however. São Paulo had incurred a heavy debt in the interest of the plan, and the State found itself the possessor of a huge stock of coffee for which it had paid at rates considerably above the market. World supplies continued to be about equal to world demand, in spite of a decline in the Brazilian crop to more normal proportions.[4] Creditors were clamoring for liquidation.

The only escape from bankruptcy seemed to lie in a refinancing of the government obligations and a definite plan for realizing on the coffee holdings, and nearly the entire year 1908 was spent in negotiations having this end in view. These recently (December, 1908) reached a successful issue, but only after the federal government had come to the assistance of the State by granting an unqualified guarantee of a new loan of £15,000,000 to be used to refund the earlier obligations.

[1] This stock was held at various European and American ports (except 657,500 bags at Santos) as security for the loans.

[2] Valorization had been in the air two years, at least, before the plan was put into operation.

[3] The proceeds for the thirteen months, December 1, 1906, to December 31, 1907, were $7,112,475.

[4] The crop of 1907–08 was 11,000,000 bags.

The essential features of this loan and the contract which accompanies it are:—

1. The federal government indorses it with an unqualified guarantee.

2. The São Paulo coffee holdings, amounting now to 6,994,420 bags,[1] are warehoused in New York and seven European ports, and warrants for them are deposited with specific banks,[2] which act as trustees for the bondholders.

3. This coffee is placed under the sole control of a committee of seven residents of the United States or Europe,[3] who are given full power over its liquidation, saving only a proviso as to minimum sales during the next ten or eleven years.[4]

4. The State of São Paulo raises the surtax from 3 to 5 francs per bag, and guarantees the application of the proceeds to the sole purpose of satisfying the interest, amortization, etc., of the loan.

5. The State likewise agrees to restrict exports to 9,000,000 bags for 1908–09, 9,500,000 bags for 1909–10, and 10,000,000 for succeeding years.

The placing of this loan marks the official end of the valorization experiment.[5]

In summing up the general results, one must bear in mind both the State government and the planters. The credit of the State has suffered severely. No proof of this statement is needed beyond the fact of the extreme difficulty in raising the final loan and the insistence of the financial world that federal guarantee must be secured. Prior to 1906 the ability of São Paulo to meet its obligations seems

[1] During the past six or eight months the State, in spite of repeated promises to the contrary, has sold *sub rosa* about 1,300,000 bags out of its holdings.

[2] Messrs. Schroeder & Co. and two French banks.

[3] Four to be nominated by Schroeder & Co., two by the Société Générale, and one by the Brazilian government.

[4] At least 500,000 bags must be sold in the six months from January to June, 1910, 600,000 in the first half-year 1911, 700,000 in 1912 and subsequent years until stock is exhausted.

[5] For full details of the loan see the Economist, December 12 and 19, 1908; United States Consular Reports, December, 1908, pp. 140–144.

to have been unquestioned, and it was borrowing freely for many sorts of permanent improvements. The direct financial loss, tho extremely difficult to estimate, has in all probability reached a sum of several millions of dollars.[1]

The results to the planter are somewhat clearer. Those whose coffee the government purchased undoubtedly reaped a financial benefit. This benefit was not, however, equal to the excess of price over the market price, for a large part of the surtax on export must be deducted.[2]

Other planters suffered to the extent of all that portion of the surtax which they were unable to shift, but, on the other hand, they, in common with all sellers, profited by the steadying of prices due to government purchases. The enormous crop of 1906–07 would unquestionably have demoralized prices, had not the State, or some one else, undertaken to hold the surplus.[3] From whatever beneficial effect thus produced, must, however, be deducted the

[1] The State incurred obligations amounting to a total of 310,000,000 milreis, reduced later by redemption of one loan of 13,500,000 milreis and the sale of 1,300,000 bags of coffee for an amount which was probably about 39,000,000 milreis, thus leaving due, before the recent settlement, 257,500,000 milreis. All the State had to show for this was 6,994,420 bags of coffee, which have now been pledged for the loan of £15,000,000. This was negotiated on terms netting the government about £12,500,000, or approximately 200,000,000 milreis. This coffee is, however, said to be worth to-day about 216,000,000 milreis. So that, if liquidation could take place now, the net financial loss would be in the neighborhood of 41,500,000 milreis, or $12,450,000. This must be regarded only as a rough estimate, however, for the published accounts are confusing and to some extent contradictory. Consul-General G. E. Anderson places it as high as $30,000,000. See United States Monthly Consular Reports, December, 1908, p. 144.

[2] In the prevailing condition of the market, with surplus production and the government stock constantly threatening the trade, the surtax could not readily be shifted. The planter probably paid most of it. As the export tax was sixty cents per bag and the price premium about one dollar and twenty cents, the planter gained at least sixty cents per bag.

[3] Comparison with previous "bumper" crop conditions abundantly proves this. 1896–97 and 1897–98 were both big crop years, the production increasing from 6,000,000 bags in 1895–96 to 11,000,000 in 1897–98. Prices declined in the same period from 160 to 85 (London Economist's index number). Similarly, production jumped from 9,500,000 bags in 1899–1900, to 15,500,000 in 1901–02, and prices fell from 85 to 73. But in 1905–06 and 1906–07 an increase in production from 11,300,000 bags to eighteen or twenty million caused only a nominal fall in price from 87 to 85. Some of this steadying effect may have been due to a shifting of a portion of the surtax, but probably not much, for reasons already stated.

loss occasioned by the prevention of reactionary rise in price such as had always before followed periods of depression.

There was yet another result to the planters,—one which must, in the end, benefit the entire industry. The government's policy of giving preference in its purchases to the better grades of coffee, stimulated efforts, already begun, to introduce improved methods. It is stated, doubtless with considerable exaggeration, that more was done in this direction in twelve or thirteen months than could otherwise have been looked for in as many years.[1]

There still remain some knotty problems to solve before the final results of government interference can be known. The disposal of the surplus stock without too great disturbance to the market, yet rapidly enough to prevent deterioration or disproportionate storage and other charges, and the promise of the State government to restrict exportation in spite of increasing crops,[2] present problems still full of menace to the industry. The placing of an import duty on coffee by the United States would ease the financial situation considerably by enabling the trustees to dispose of their accumulations in this country[3] at a profit, but it would only increase the difficulties of the planters and the São Paulo government.

The whole experience serves to emphasize the dangers of government interference with industry. The State of São Paulo came to the rescue of its planters in a situation which the latter had created by their own short-sightedness. Possibly such action may be partly justified in view of the vast importance to the State of that particular industry. Possibly, too, it may be said to have been partly successful, provided the problems still remaining be solved without further disaster. Yet, even if partly successful, it has been so only at large direct loss to the State Government, and

[1] Economist, September 19, 1908.

[2] There is strong probability that the crops will exceed the maximum export allowed by the contract.

[3] Said to be some 4,000,000 bags.

serious impairment of its credit, and has encouraged producers to rely on government aid rather than their own efforts. It is safe to say that the coffee industry will not resume a normal and thoroughly satisfactory condition until the planters resolve to stand on their own feet. This will involve the introduction of better methods all along the line, the closer watching of costs of production, willingness to accept low profits compared with those of ten or fifteen years ago, and the elimination of the weaker producers.

LINCOLN HUTCHINSON.

UNIVERSITY OF CALIFORNIA.

NOTES AND MEMORANDA.

A REPLY TO CRITICS.

Needless to say, I have been intensely interested in the comments on my two books, *The Nature of Capital and Income* and *The Rate of Interest*, which have been made by Professor Commons[1] and by Professor Flux.[2] There seems very little in either review to call for extended reply. Both authors acknowledge themselves in thorough sympathy with the main methods and conclusions of the books, and confine their criticisms, for the most part, to minor and non-essential details. Moreover, as Professor Flux has said, the differences are more apparent than real, owing to differences in nomenclature, and, I may say, owing also in part to my failure in some cases to make my meaning clear.

For instance, Professor Commons seems to think that I overlooked the profound differences between what he calls "political economy," or the study of social welfare, and "business economy," or the study of individual interests; and that there is, if not an error, some distortion of view contained in my inclusion among the "services of wealth" the "exclusive" aspect, as when wealth is used by the owner as a weapon to restrain others. For reply I would refer the reader to an address on this subject before the Economic Section of the American Association for the Advancement of Science.[3] The capital invested in a blackmailing news-

[1] Professor John R. Commons, "Political Economy and Business Economy: Comments on Fisher's Capital and Income," Quarterly Journal of Economics, November, 1907.

[2] Professor A. W. Flux, "Irving Fisher on Capital and Interest," Quarterly Journal of Economics, February, 1909.

[3] "Why has the Doctrine of *Laissez Faire* been Abandoned?" Irving Fisher, Science, N. S., vol. xxv., No. 627, pp. 18–27, January 4, 1907.

paper, in a counterfeiting establishment, in a shop for the manufacture of burglar's tools, in a bureau for the corruption of legislatures, in an opium den, or in other enterprises injurious to society, will always be capital so long as it renders its "services" to the owners who benefit thereby. The fact that they render disservices to others is of vital consequence, but does not directly concern the subject-matter of my books, which is to follow the causes which actually determine market valuations. The truth is that market valuation seldom, if ever, exactly registers utility to society. The building of a new railroad will increase the value of certain productive real estate and decrease that of residential districts; but we shall look in vain into the records of sales of railway shares for any indication of these effects. The study of these effects forms a subject by itself and one far too large and complicated to have been combined with a study of the topics chosen for my two books.

The proper place for a study of social pathology and therapeutics seems to me to be at the end and not at the beginning of economic analysis. We shall reach sounder conclusions in regard to the best remedies to be applied to social conditions if first we study those conditions exactly as they are and not as we should prefer to have them. Our analysis should be as complete and as faithful to the facts as possible.

In this connection I may make an observation, forced on me by the reviews which I have thus far seen. It is that analysis, on the one hand, is overwhelmingly important, while mere classification, on the other hand, is unimportant. The motto which John Rae adopted from Hume might fitly be adopted by all economists: "Our speculations can scarce ever be too fine, provided they be just." Most economists are so anxious to proceed rapidly that they proceed carelessly. While I have been accused in my books of too minute analysis, my own chief regret is that the analysis was not still more minutely expressed, for it is precisely on the minute points that my best critics,

it seems to me, have gone astray. Professor Flux, for instance, objects that my income concept does not apply to the physical product of capital, but to the act of producing that product. To the ordinary reader it seems useless hair-splitting to insist that the income yielded by an orchard is not the physical apples, but the event of yielding up or giving over these apples to the storehouse into which they next pass. I do not care much what is done with the *term* income, but I believe a careful study will show that the concept—whatever we call it—which includes the apples yielded is of little value to economic analysis compared with the concept which applies to the yielding of the apples. The latter concept lends itself at once to social book-keeping. The event of separating the apples from the orchard can be entered at once as a credit item for the orchard account and a debit item for the storehouse. This would not be true of the apples themselves, which are never income, but always capital, whether on the trees or in the storehouse. The advantage of utilizing the concept to which, whether correctly or not, I have applied the name "income," is still more vital when we come to consider the discount relations involved. Capital value is the capitalization of what I have called income. It is not in all cases the capitalization of items which enter into any other of the many definitions which have been given to income. It was this amenability to analysis which led me to denominate this concept by the name "income." It is scarcely worth while to insist strenuously on any particular use of terms, but it is important to point out the relative analytical value of different concepts. Physicists call the product of the mass of a moving body by the square of its velocity (divided by two) its kinetic energy. I am sure they would not think it worth while to quarrel with any one who wished to use this phrase in the sense of the mass multiplied by the cube of the velocity. But the former concept is useful, and the latter relatively useless, the former lending itself to the discussion of what has been

called (whether happily or not, does not matter) the conservation of energy.

Professor Flux in his review seems to overlook or omit the mutual relations of discount and interest which constitute the *raison dê'tre* for the concepts which I have called capital and income. It is chiefly because "savings" do not enter into these discount relations on equal terms with other items of income that savings do not form a part of what I have called the income concept. I do not think there are reasons of terminology alone sufficient to justify the inclusion of savings in income. But, if savings are to be so included, some other term must be applied to take the place of what I have called income. The justification of these statements must rest on my books themselves and on a later paper devoted to this subject.[1] I am willing to stand by the test Professor Flux ascribes to me: "the attitude towards the mystic question 'Are Savings Income' serves as a kind of crucial test to distinguish those who are sound in their views from the others. This problem is Professor Fisher's *pons asinorum* for economists."

Both Professor Commons and Professor Flux demur somewhat at the relatively unimportant rôle which they believe is assigned in my books to the subject of "cost." The objections of the two are different, however. Professor Commons has some sympathy with the modern popular prejudice against valuing any article of capital, especially when monopolized, above its original cost. In other words, Professor Commons, while admitting that the cost does not control value, maintains that it ought, by legislative enactment and otherwise, to be made partially to control value. Professor Flux, on the other hand, maintains to a larger extent than I have admitted that cost does actually control value.

First, I will disclaim any intention to underestimate the importance of the cost concept. The importance it holds in my mind is not to be measured by the number of pages

[1] "Are Savings Income?" Publications of the American Economic Association, vol. ix., No. 1, April, 1908.

devoted to it in the books, the main purpose of which was to study capitalizations of income. I believe that the position on cost which was taken by Professor Davenport in his brilliant book, Value and Distribution, is in general the correct one. What I attempted to point out was that those double-faced events which I have called interactions, and which always have a double entry, a positive and negative entry, in social book-keeping, are not ultimately cost any more than they are ultimately income. I also tried to emphasize that cost enters into capitalization on equal terms with income, *when the cost is future*. Past cost does not affect present valuations except indirectly, as it must affect future expected income and cost.

I am not sure that I understand Professor Flux's apology for appraising wealth at cost value. He certainly would not maintain that obsolete machinery, even in good physical condition, could be appraised on the basis of its cost. The only cases in which cost (with interest) is equal to value is where this value is also equal to the estimate of worth on the basis of future expectations; when, in other words, cost is superfluous as a determinant of value. That cost does influence value by limiting supply, thereby affecting the quantity and value of future services, cannot be questioned. It is natural that business men should not follow this roundabout relation, but connect directly cost with value. This, however, is no reason for economists failing to analyze the relation in all its complications.

Professor Flux evidently regards me somewhat of an iconoclast. As a matter of fact, I have never wished to tear down any previous economic structure so long as it was possible to build upon it. On the contrary, my aim has always been to look for agreements rather than disagreements, and I always feel satisfied when economists recognize, as Professor Flux does in one part of his article, that the presentation I have made is in many respects, if not in most, merely the older conclusion in a new dress. I would not even insist on newness of dress, were any of the older garments sufficiently service-

able, but the truth is these older garments only partially fit. Moreover, there seemed to be no prevailing fashion. It is the history of all science that terminology and definitions will constantly change until exactly adapted to serve the concepts for which they are merely names. Even where possible, it is usually awkward to cling to older usage in the light of newer analysis. The whole subject of terminology, however, occupies in my estimation a very secondary place.

I should be entirely willing, for example, if there were fairly unanimous sentiment to that effect, to exclude free human beings from the concept of capital, in spite of the many advantages of including them. It would simply be necessary, in many cases, to substitute the long phrase "capital and free human beings" in place of the one word "capital." It is not on its classificatory side that I would insist on my concept of capital, but on its analytical side—its relations to time and to discount. Classification, as I have always insisted, has of itself no power to solve scientific problems. It plays a very subordinate rôle in all that I have written. Nothing has surprised me more than the opinion expressed by one of my critics that *The Nature of Capital and Income* was a study of classification or taxonomy;[1] but I reserve answer to this criticism for a separate article elsewhere.

IRVING FISHER.

YALE UNIVERSITY.

[1] Thorstein Veblen, "Fisher's Capital and Income," Political Science Quarterly, March, 1908. How malapropos Professor Veblen's characterizations are may be seen by comparing them with my views on economic method as expressed in "Economics as a Science," Science, N. S., vol. xxiv., No. 609, pp. 257, 261, August 31, 1906.

THE MINNESOTA RAILWAY VALUATION.

In spite of frequent and forcible denunciation of the movement as "arrant economic moonshine," the effort to arrive at a knowledge of the value of railroad properties on the physical side still continues. Minnesota is the latest State to prepare such a valuation. The work was undertaken by the Railroad and Warehouse Commission three years ago, and was made public in January of the present year in the form of a supplement to the annual report for 1908. It has been the purpose of the Commission to make a more comprehensive and more detailed investigation of the problem than had previously been made by any public officials; and the report of the engineer in charge of the work seems to show that this purpose has been carried out.

The methods followed in making the valuation do not differ materially from those employed in the Michigan and Wisconsin valuations. The co-operation of the companies was enlisted. They filled out blanks prepared by the Commission showing in detail quantities and values; and these returns having been made, the Commission began the work of checking and verifying them.[1]

[1] "The method employed by the Commission in verifying the statements submitted by the railways has been to make a more or less minute inspection of the various properties. When a section or sections of a road were to be inspected the Commission has hired at the expense of the state a special train over whose movements it had complete control. The train would be taken out over the road by one or more members of the Commission, accompanied by the chief engineer of the Commission, two assistant engineers, and the division superintendent and roadmaster of the railway. The train was stopped at intervals of from one mile to four or five miles, the length of the run depending upon the character of the part of the road being passed over. The blanks that had been filled by the railway with information respecting the physical properties in and along the line traversed were taken along. When the train stopped the party got out, and the engineers of the Commission made a careful inspection of the roadway, adjacent buildings, etc., counting the ties, examining the rails and their fastenings, measuring the cuts and fills, classifying tunnels and bridges, examining the buildings and noting in their field books what they found. The actual conditions and facts observed were compared with the information which the railway had submitted regarding this particular portion of its line." Twenty-third Annual Report, Railroads and Warehouse Commission, 1907.

While it is expected by the Commission that the valuation may throw some light on the question as to whether the gross earnings tax which the railroads now pay in lieu of all other taxes is fair or not, its avowed chief purpose in making the valuation is to furnish a basis for rates within the State. The inquiry was not begun because the Commission has any new theory of rates or of value to advance, but as a result of the repeated declaration of the courts that the "fair valuation" upon which the railroads are entitled to a "reasonable return" is in some way related to the investment made, to the cost of reproducing the property, and to the present value. Just what weight may be assigned to each of these factors by the court in any given case, no one can tell. They are factors, however, about which the courts desire accurate information; and the Minnesota Commission has undertaken to supply it rather than leave it for the railroads to supply.

Already the valuation made by the Commission has become of the greatest importance in the cases now pending in the Federal court. The Legislature of 1907 enacted a two-cent fare law and a commodity rate law, both of which, it was "understood" at the time, the railways would accept without a contest. These laws have, however, been attacked, as well as the merchandise rates put into force by the Commission in the fall of 1906. A master in chancery has been taking testimony since last July in what promises to be the most exhaustive judicial inquiry into the question of a "fair valuation" yet made in this country. The part the Commission's valuation is likely to play in these cases makes its work of the utmost importance.

It had been the hope of the Commission to present data covering the original cost of the railroad properties, but loss or destruction of reports of most of the early roads has made this impossible. The report presents no data on this subject, though it is understood estimates of original cost have been made, based on the cost of recently constructed roads, for submission to the court. The report shows the "cost of reproduction" of the properties new, as

of date of June 30, 1907, at the average prices for labor and materials current for the year 1905, also the "present value" ascertained by deducting from cost of reproduction new the depreciation estimated for each property.

The Commission is contending for a construction of "cost of reproduction" very different from that urged by the railroads, the acceptance or rejection of which involves many millions of dollars in the valuation, and thus affects, presumably, the basis of rate making. The Commission followed the well-known "sales-method" in appraising the right of way and terminal sites. It is a matter of common knowledge that a railroad company, for reasons easily understood, has usually to pay more than the market price of land for right of way. The transfers examined for this report show that on the average the companies had to pay 1.7 times as much as the normal value. The average ratio for individual roads ranges from 1.2 to 3. This ratio of the price the railroads had to pay to the normal value of contiguous land is called by the engineer the "multiple," and the point of contention is over the inclusion of these multiples in the "cost of reproduction." The Commission holds they should not be included. Its position seems to be this: If a railroad is being built through a territory where land is worth, say, $10 per acre, and the company has to pay $30 for its right of way, that must be written down as its cost. If contiguous lands advance to $100 per acre, no question is raised as to the railroad's right to the increment. The railroad and the farmer alike may enjoy the benefits society has bestowed upon them. But it is held to be unjust to allow that increased value to be multiplied by three for a "railroad value" of the land on the hypothesis that the road would have to pay $300 if it had to build the road new. Railroads do not have to acquire a right of way every time there is an advance in the price of land. The determination of this question is already one of great moment. Including the multiples, the value of right of way and terminal lands in Minnesota with its 7,596 miles of roadway is $73,201,757. Omitting them, it is $41,275,-

259, a difference of $32,000,000. The Commission points out that the divergence between normal and railroad values will be greater as time goes on, and that the treatment of this difference is fraught with grave consequences.

Another point of contention is over the inclusion of an item of some $12,000,000 for adaptation and solidification of road-bed. The theory on which it is proposed to exclude this item from cost of reproduction is that it was not paid out of capital, but out of income and charged to operating expenses. Such betterments, of course, should never have been paid for out of earnings; but, when it is remembered that the courts have generally clothed such transactions with a sacrosanct character when once they have been capitalized and stocks have passed into the hands of investors, it does not seem probable the Commission will carry its point.

If these two items are included, they will affect materially such items of cost as the percentage allowed for "engineering, superintendence, and legal expenses," the allowance for "contingencies," and that for interest during construction. The cost of reproduction new, including the disputed items, amounts to $411,735,194. Omitting these items, it is $360,961,547. But this is not the true present value at date of appraisal. Deducting the carefully made estimates of depreciation of certain kinds of property, as rolling stock, rails, ties, and the like, the Commission's "present value," including the multiples and adaptation of road-bed, is $360,480,160; while omitting these, it is $309,706,518. The cost of reproduction submitted by the railway companies for June 30, 1906, which, of course, include the disputed items, and apparently makes no allowance for depreciation, is $500,675,780.

The results of the investigation have been a surprise to shippers and others who have been contending that the roads have been over-valued and over-capitalized, and that rates should be reduced. The commercial valuation of the Census Bureau as of June 30, 1904, showed the Minnesota roads to be worth $59,800 per mile. The stock and bond value

of the roads as shown by the report under review, for June 30, 1907, the date of the physical valuation, showed the nineteen carrying roads of the State to be capitalized at $44,206 per mile. Such valuations have been thought by the advocates of rate reduction extravagant and useless as a basis of rate legislation. The Sundberg Senate Committee of 1907, after a hasty inquiry into the value of the properties to secure a basis for legislation during the session of that year, reported $27,000 per mile as a fair valuation; and this apparently had some weight in securing the rate reductions of that year. The physical valuation which had been made in Wisconsin in 1903 had also been relied upon; and that had given the cost of reproduction at $30,900 per mile, and the present value at $25,500, in a neighboring State where railroad building was scarcely more difficult than in Minnesota. The Commission's appraisal seems, therefore, startlingly high to those who have been familiar with these figures. The cost of reproducing the nineteen carrying roads, capitalized as shown above at $44,206 per mile, is found by the Commission to be $52,430 per mile, when multiples and adaptation and solidification of roadway are included, and $46,202, omitting these items.

The difference in the results of the Wisconsin valuation and those of the Minnesota inquiry is not easily explained. The Wisconsin roads are somewhat nearer the markets where supplies are bought, the average prices used for the five-year period prior to 1903 were considerably lower than the 1905 prices used by the Commission, and terminal properties in Minnesota are more valuable than those in Wisconsin; but, after making allowance for these differences and for the psychological element involved in the fact that in Wisconsin the valuation was made as a basis for taxation, while in Minnesota it was made as a basis of rate regulation, the discrepancies in the two valuations are not easily explained. Nevertheless, the report must be looked upon as an important aid towards the solution of several questions concerning a "fair valuation" which are in great need of clarification. It will be of interest to observe what

disposition the courts will make of the several questions raised by it.[1] If the higher valuation is allowed by the courts, another issue is sure to be raised, over the question of taxation. Indeed, it is already raised by the State Tax Commission in its report for 1908, where it is shown that the taxes paid under the 4 per cent. gross earnings law fall short by $1,800,000 of the amount that ought to be paid if the valuation contended for by the railroads is accepted. In that case it is certain the legislature will increase the rate of the gross earnings tax.

G. O. VIRTUE.

WINONA, MINNESOTA.

[1] A comparative view of the various valuations mentioned above is for convenience given below:—

	Total.	Per Mile of Roadway.
Railroad and Warehouse Commission appraisal:—		
Reproduction, all roads, including multiples, etc.	$411,735,194	$54,201
Reproduction, all roads, omitting multiples, etc.	360,961,547	47,517
Present value, all roads, including multiples	360,480,160	47,456
Present value, all roads, omitting multiples	309,706,563	40,772
Reproduction, carrying roads, including multiples	397,299,470	52,430
Reproduction, carrying roads, omitting multiples	350,106,320	46,202
Railroad Companies appraisal, June, 1906, all roads	500,675,780	65,909
Commercial value, Census Bureau, 1904	466,734,000	59,800
Stock and Bond Debt, nineteeen carrying roads, 1907,	334,979,691	44,206
Sundberg Senate Committee, 1907	215,000,000	27,000
Physical valuation, Wisconsin roads, 1903:—		
By the State Tax Commission	—	30,900

THE BURDEN OF THE SUGAR DUTY.

In an article published in the *Atlantic Monthly* for March, 1908, entitled "Sugar: a Lesson on Reciprocity and the Tariff," I presented an estimate of the amount collected from American consumers by the existing duty on sugar; *i.e.*, the duty under the tariff act of 1897.

For convenience of reference I reprint the tabular statement, made out for the year 1906, which summarized this estimate.[1]

Total Tax Burden.		Distribution of the Receipts.				
					Received by the United States Treasury.	Received by Sugar Producers.
Taxes paid on a total consumption of 6,370 million pounds of sugar	$101,000,000	On 1,128	millions of	full duty sugar	$19,100,000	
		" 2,782	"	Cuba sugar	32,800,000	$9,200,000
		" 69	"	Philippine sugar	500,000	200,000
		" 712	"	Hawaii sugar	—	11,700,000
		" 410	"	Porto Rico sugar	—	6,800,000
		" 594	"	Louisiana sugar	—	9,600,000
		" 672	"	domestic beet sugar,	—	11,100,000
	$101,000,000	Total			$52,400,000	$48,600,000
						$101,000,000

It will be remembered that a comparatively small amount of our sugar supply pays the full amount of the nominal duty. That which comes from Louisiana and the domestic beet sugar regions is, of course, free from tax, and that from Hawaii and Porto Rico is also free. Another very large portion has a partial remission of duty,—Cuban sugar to the extent of 20 per cent., Philippine sugar to the extent of 25 per cent. The table was constructed on

[1] See the Atlantic Monthly, March, 1908, p. 342. The figures are quoted in the recent edition of Ely's Outlines of Political Economy, p. 309.

the assumption that, tho only a small portion pays the full duty, the price of all the sugar is raised throughout the year by the full amount. This assumption, however, needs to be qualified in two particulars.

(1) That the Cuban importations presented a peculiar problem was intimated in the *Atlantic* paper. "There is probably some allowance to be made," I then wrote, "for the fact that at certain seasons of the year the Cuban crop dominates the market and that for a while this is not raised in price by the full amount of the duty." The allowance on this score, it appears, should be considerable.

Cuban sugar dominates the market during a large part of the year, and especially the first three months of the year. During these early months no other duty-paying sugar is imported, and the rate on Cuban sugar (80 per cent. of the full rate) is the only really effective duty. The price of sugar is then raised only by this moderated tax, and it is the domestic purchaser rather than the Cuban producer who gets the benefit of the 20 per cent. remission. As the season goes on, in spring, the pressure from Cuban sugar becomes less, and a half-way stage ensues: the remission goes partly to the benefit of consumer, partly to that of the planter. And, finally, as the Cuban crop is all worked off, other (neutral) sugar begins to come in, and the full duty becomes effective.

Interesting details on this topic are given in some testimony submitted the Ways and Means Committee by Mr. E. F. Atkins. Figures for each week in 1907 and 1908 are there given, comparing the actual price of sugar with the price which would have ruled if the full duty had been added to the outside foreign price (that is, to the price of beet sugar at Hamburg). The following figures, which are for the first date in each month of 1907, suffice to indicate the general situation. The first column, labelled "Hamburg parity," states what the price of imported sugar would be in New York if the full duty were added to the Hamburg price. The second column states the price at which Cuban sugar actually sold in New York. The third

gives the difference,—the amount by which the price of Cuban sugar failed to reach "Hamburg parity."[1]

1907.	Hamburg Parity.	Price of Cuban Sugar, duty paid.	Difference.
January 3	3.84	3.56	.028
February 7	3.84	3.42	.42
March 7	3.89	3.51	.38
April 4	3.93	3.61	.32
May 2	3.99	3.765	.225
June 6	4.09	3.84	.25
July 3	4.00	3.835	.165
August 1	4.04	3.94	.10
September 5	4.16	3.92	.24
October 3	4.04	3.95	.09
November 7	3.96	3.90	.06
December 5	3.98	3.625	.355

The full duty, it will be remembered, on sugar (testing 95°) is 1.65 cents. The Cuban differential is 20 per cent., or .33 cents. The net duty on Cuban sugar is therefore 1.32 cents.[2] A glance at the table shows that during the first three months of the year, when the Cuban crop is brought to market, the Cuban planter loses his differential. The price of sugar is raised only by the net Cuban duty of 1.32 cents, not by the full duty of 1.65. As Mr. Atkins explained, "during the period of heavy Cuban receipts . . . the pressure to sell, owing to the excess of receipts over requirements, brings the sugar market down in New York, so that the Cuban planters lose the differential that is accorded to them." During this season of course, there can be no other imports. By the autumn, when the New York price again rises until it exceeds the outside (Hamburg) price by the full duty, imports from neutral regions are resumed.

[1] Tariff Hearings before the Committee of Ways and Means, pp. 358, 359. Figures for 1908 are there also given. See also the testimony of Mr. Spreckels, pp. 395, 403. For 1906 the figures have been kindly furnished to me by Mr. Atkins. They tell the same story. Messrs. Willett and Gray, of New York, inform me that the situation has been substantially the same ever since the date (1903) when the reciprocity treaty with Cuba went into effect.

[2] On 96° sugar the duty is 1.68½ cents, the Cuban differential .34, and the net duty 1.34½ cents.

It would seem, also, that the price of refined sugar goes down with that of raw sugar. It is not the refiner who gets the benefit of the Cuban remission, for the difference between the price of refined and raw sugar is not, on the whole, greater during the early months of the year than during the later.[1] The gain goes chiefly to the consumer,—or, at least, to the wholesale and retail grocers, through whom, with more or less of friction and uncertainty, all such gains gradually filter to the consumer.

This situation has developed in very recent years, because of the great increase in the supply of free or partly free sugar. A steadily smaller part of the supply comes from the neutral regions whose sugar pays full duty. The stage has already been reached where, during a good part of the year, no full-duty sugar comes in, and the effective duty is that on Cuban sugar.

It will probably not be long—supposing the existing rates of duty and the existing remissions of duty to be maintained—before full-duty sugar entirely disappears, and the Cuban rate becomes the effective one all the year around.

(2) Another qualification needs to be made, as to domestic beet sugar. The increase in our beet sugar supply has been remarkably rapid in the last ten years. It has taken place, not in the strictly agricultural region, but chiefly in California and in the states of the semi-arid region, such as Colorado, Utah, Idaho. Michigan is the only one of the states of the Middle West in which the production is considerable. The causes of the increase in the Far West and of the absence of development in the Middle West, outside Michigan, are interesting and instructive. They still seem to me to rest on the principle of comparative costs: it pays the farmer of the Middle West better to do other things.[2] But it is not within the purpose of the present note to consider this aspect of the situation. The fact is that in the Far West, where the climatic and agri-

[1] See the figures given by Mr. Atkins in the Hearings, p. 361.

[2] See what is said in my Tariff History of the United States, pp. 372 *seq.*

cultural conditions are very different from those of the Middle West, the production of beet sugar has greatly increased.

The supply of beet sugar hence has come to be greatly in excess of local consumption in California and the Rocky Mountain region, and has had to press for a market farther and farther to the eastward. During the period of the "campaign"—six or seven months in the year, chiefly in autumn and winter—beet sugar makes its way as far east as Chicago and Pittsburg, and sometimes even as far as New York State.[1] At Chicago it meets the Cuban sugar; tho this latter, as it happens, comes to market, in the main, at a different season. But beet sugar, of course, has to pay freight from the points of production to its Eastern market. And, from the same circumstance, it is cheaper, by the amount of the freight, at the points of production than in the Eastern market. In its local region, therefore, say at Denver and at Salt Lake City, probably at Omaha, it is cheaper than in Chicago and Pittsburg. In other words, in its local region, it is not raised in price by the amount of the duty, probably not even by the amount of the reduced Cuban duty. The full effect of the duty would appear only if the domestic price of sugar were equal to the foreign price, plus full duty, plus cost of transportation to the point of consumption. Beet sugar, at its local markets in the Far West, is not raised in price so much as this.

To calculate the burden of the sugar duty, in view of those qualifications, would be a complicated task. Only one very familiar with all the details of the trade could undertake to do it with complete accuracy. During part of the year the effective duty is the full nominal rate; during another part of the year, the effective duty is that on Cuban sugar,—only 80 per cent. of the nominal rate. The total tax on consumers, and the total bonus to the various favored producers, would be somewhat less than

[1] Hearings before the Ways and Means Committee, pp. 281, 282, 314.

was calculated in my tabular statement. The total tax would be reduced from a round $100,000,000 to somewhere between $80,000,000 and $90,000,000. The bonus received by Cuban sugar planters would largely disappear: that going to other favored producers would be reduced to something like $30,000,000. The burden is still heavy enough; and the bonus to the planters of Hawaii and Porto Rico, not to mention the strictly domestic producers, is still more than generous.

F. W. TAUSSIG.

HARVARD UNIVERSITY.

BOOKS RECEIVED.

Agathe, Dr. A. Ursprunge und Lage der Landarbeiter in Livland. Tübingen: H. Laupp. 1909. pp. 158. 4 m.

Andréadès, A. History of the Bank of England. London: P. S. King & Son. 1909. pp. 455. (Translated by C. Meredith.)

Beveridge, W. H. Unemployment. A Problem of Industry. London: Longsmans, Green. 1909. pp. 317. $2.40.

Bridgman, R. L. The Passing of the Tariff. Boston: Sherman, French & Co. 1909. pp. 272. $1.20.

Bunau-Varilla, P. The Text of a Lecture before the Commercial Club of Boston on the Panama Canal. 1909. pp. 68.

Chapin, R. C. The Standard of Living among Workingmen's Families in New York City. New York: Charities Publication Committee. 1909. pp. 372. $2. (Russell Sage Foundation.)

City of New York, Advisory Commission on Taxation and Finance. *Title*, Final Report. New York: M. B. Brown Co. 1908. pp. 162.

Conant, C. A. A History of Modern Banks of Issue. New York: G. P. Putnam's Sons. 1909. pp. 571. (Fourth edition, revised and enlarged.)

Davidson, J., and Gray, A. The Scottish Staple at Beere. London: Longmans, Green & Co. 1909. pp. 453. 12*s.* 6*d.*

de Las Cases, Ph. Le Chômage. Paris: V. Lecoffre. 1909. pp. 191. 2 fr.

Denis, Pierre. Le Brésil au XX^e^ Siècle. Paris: A. Colin. 1909. pp. 312. 3.50 fr.

Folz, E. K. The Federal Civil Service as a Career. New York: G. P. Putnam's Sons. 1909. pp. 325. $1.25. (A Manual for Applicants for Positions and Those in the Civil Service of the Nation.)

Fry, W. H. New Hampshire as a Royal Province. New York: Columbia University. 1908. pp. 525. $3.

Geisser, A. Fatti ed Argomenti intorno alla Municipalizzazione. Torino: Società Tipografico-Editrice Nazionale. 1909 pp. 149.

Gide, C. Cours d'Économie Politique. Paris: Larose et Tenin. 1909. pp. 794. 10 fr.

Guyot, Y. Le Commerce et les Commerçants. Paris: O. Doin et Fils. 1909. pp. 534. (Encyclopédie Scientifique.)

Henderson, C. R. Industrial Insurance in the United States. Chicago: University of Chicago Press. 1909. pp. 429. $2.

Hillquit, M. Socialism in Theory and Practice. New York: Macmillan. 1909. pp. 361. $1.50.

Huszadik Század. La Hongrie Contemporaine et le Suffrage Universel. Paris: Giard et Brière. 1909. pp. 272.

Ingenbleek, J. Impôts Directs et Indirects sur le Revenu. Bruxelles: Misch et Thron. 1908. pp. 520. (Instituts Solvay.)

International Tax Association. State and Local Taxation. Second International Conference. Addresses and Proceedings. Columbus: International Tax Association. 1909. pp. 636.

Kennedy, J. B. Beneficiary Features of American Trade Unions. Baltimore: Johns Hopkins Press. 1909. pp. 128.

Köhler, Dr. C. Problematisches zu Friedrich List. Mit Anhang: List's Briefe aus America. Leipzig: C. L. Hirschfeld. 1908. pp. 259. 6 m.

Lazard, M. Le Chômage et la Profession. Paris: Félix Alcan. 1909. pp. 379. 7.50 fr. (Contribution à l'Étude Statistique du Chômage et de son Coefficient Professionnel.)

Ministère des Finances. Bulletin du Ministère des Finances. Vol. I., II. Athens: Government of Greece. 1908. I., pp. 176; II., 160.

Morawetz, V. The Banking and Currency Problem of the United States. New York: North American Review Pub. Co. 1909. pp. 119. $1.

Mumford, E. The Origins of Leadership. Chicago: University of Chicago. 1909. pp. 87. 50 cents. (Ph.D dissertation.)

Munro, W. B. The Government of European Cities. New York: Macmillan. 1909. pp. 409. $2.50.

Myers, W. S. The Self-reconstruction of Maryland, 1864–1867. Baltimore: Johns Hopkins Press. 1909. pp. 131.

Office du Travail et Inspection de l'Industrie, Royaume de Belgique. Construction des Machines et Appareils Électriques. Bruxelles: J. Lebègue et Cie. 1908. pp. 344. 3.50 fr.

——. Les Industries à Domicile en Belgique. Volume IX. Bruxelles: J. Lebègue et Cie. 1908. pp. 411. 4.50 fr. (L'Industrie de la Lingerie à Bruxelles, par R. Vermant. Enquête sur les Salaires dans l'Industrie du Vêtement pour Hommes.)

——. Les Industries à Domicile en Belgique. Volume X. Bruxelles: J. Lebègue et Cie. 1909. pp. 373. 4.50 fr. (Étude Statistique des Familles Ouvrières. Comprenant des Ouvriers à Domicile.)

Pareto, P. Manuel d'Économie Politique. (Translated from the Italian.) Paris: Giard et Brière. 1909. pp. 695. 12.50 fr.

Robertson, J. M. Trade and Tariffs. London: A. & C. Black. 1908. pp. 331.

Seligman, E. R. A. Progressive Taxation in Theory and Practice. Second edition. Princeton: American Economic Association. 1908. pp. 335. $1.25. (Second edition, revised and enlarged.)

Towler, W. G. Socialism in Local Government. New York: Macmillan. 1909. pp. 336. $1.50.

Tsur, N.-C. Die gewerblichen Betriebsformen der Stadt Ningpo. Tübingen: H. Laupp. 1909. pp. 113. 3 m.